

EXCITING STORIES OF SCIENCE AND FANTASY

VOLUME 23
NUMBER 4

AMAZING STORIES

APRIL
1949

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The MONSTER

By S. M. TENNESHAW

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Published monthly by ZIFF-DAVIS PUBLISHING COMPANY at 185 North Wabash Ave., Chicago 1, Ill. New York Office, Empire State Building, New York 2, N. Y. Entered as second class matter April 11, 1946, at the Post Office, Chicago, Illinois, under the Act of March 3, 1879. Subscription: in U. S., Canada, Mexico, South and Central America and U. S. Possessions, \$2.50 for 12 issues; all other foreign countries, \$3.00 for 12 issues. Subscribers should allow at least two weeks for change of address. All communications about subscriptions should be addressed to the Director of Circulation, Ziff-Davis Publishing Company, 185 North Wabash Ave., Chicago 1, Ill.

All Stories Complete

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 What would happen to a man subjected to the cosmic radiations in a V-2 one hundred miles up?
- UNTHINKABLE** (Novelet—12,000) by Rog Phillips 34
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 We're accustomed to reality as it is, but what if it isn't what we think? Could we understand?
- THE SUN KING** (Short—4,000) by Gaston Derreaux 52
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- VALLEY OF THE CROEN** (Short novel—35,000) by Lee Tarbell 74
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 A tiny golden statue lured them into the valley—and they found incredible invaders from space.

Cover painting by Arnold Kohn, illustrating a scene from "The Monster."

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The

OBSERVATORY

..... *by the Editor*

WE HAVE another discovery to announce with this issue—the discovery of another writer who, we predict, will stir you to the heights of excitement and pleasure. He is Lee Tarbell, and his first attempt for us is a 35,000-word short novel entitled "Valley Of The Croen." When you have read it, you will discover that here is a writer who can sling adventure of the highest sort around like a magician can deal cards—and it's not off the bottom of the deck either.

You've heard of the flying disks, of course, and perhaps it's natural that authors use them as the newest type vehicle for space travelers; but we predict you'll find that the author has been more than original in his creation of a set of characters so unusual that even to the strange climax of the story, you'll find yourself gasping at them.

PERHAPS one of the most unusual stories we've ever run is "Unthinkable" by Rog Phillips—but then, you should realize by now that it is "unthinkable" for Rog Phillips to write anything but the unusual in CAPITAL letters. When you've gotten into this story, you will find yourself confronted with a series of situations which are guaranteed to baffle you completely. And yet, when you've finished, you will have been given a concept so new and "unthought of" that you will find it a little difficult to return to the familiar world you *know* is real . . . or is it?

OUR cover this month is by Arnold Kohn, and we're particularly proud of it. It is a very fine painting, and demonstrates a rare artistic and technical ability on the part of the artist. Well, we will admit that S. M. Tenneshaw was faced with a real problem when we handed him this one to work into a story. We'll have to admit, too, that he did a very unusual job of it. "The Monster" is a yarn that just doesn't add up to the usual story of a monster—it's different, and right up to the minute. After all, down at Los Alamos, our scientists are finding out some startling things about our universe, beginning with the atmosphere only a hundred miles up, that bring accepted beliefs crashing down around our ears. For instance, that space is so darned hot we can't even imagine it—

instead of the absolute zero scientists have been telling us it is. And that there are other mysteries which toss our concepts of cosmic rays into the junk heap even before we've gotten them fairly figured out. We mean about the sun having no magnetic field, so that it just can't be the source of cosmic rays as we've believed. Golly, it sure upsets us to have all our education so wasted. Now we've got to begin all over!

OUR new writer, Gaston Derreaux, has given us an unusual short called "The Sun King" which isn't exactly fiction. It's based on very ancient Persian legends, and maybe some of our more studious readers will find more in it than they bargained for. Perhaps the story is more true than even Derreaux realizes. . . . Anyway, it's an unusual situation, and you'll chuckle when the king is "hoist by his own petard."

H. B. HICKEY gives us "Daughters Of Doom" which you'll find is up to the usual Hickey standard. Which completes the lineup of stories for this issue. However, you'll find that we have included a large number of interesting features in this issue also, including two crossword puzzles which we think you'll enjoy working. They have quite a few special words right out of past issues of *Amazing Stories*, and you'll have to be on your toes to get them. Work these puzzles out, and you're above the average in science-fiction experience. "Discussions," as usual, prints some of the choice letters from readers, and "The Club House" is one of the best we've seen so far. It should hit the spot with you fans.

WE'VE got a bit of news for you fans, along the Winchell line. Your old favorite (author and editor) William Lawrence Hamling, stepped off the deep end on December 31 (to take advantage of the full exemption on his income tax, we suspect) and got married to Frances Yerxa, whose stories and articles you have enjoyed many times. We think that Bill is stepping into a pretty big pair of shoes, when he tries to fill the spot left by the famous Leroy Yerxa. Best of luck, Bill and Frances! *Rap*

★ ANCIENT MARVELS ★

HAVE present day scientists, artists and builders reached an apex of knowledge and perfection? Is every modern marvel of construction an improvement over anything achieved in the past? A glimpse into antiquity offers a challenge to anyone today who might think the answer to the above questions is in the affirmative. For sheer beauty, permanence and perfection of architecture, some of the products of the ancients have few equals in the proudest achievements of the modern world.

Consider, for instance, the tomb of King Mausolus. Only a tomb, but the most beautiful tomb ever built. It stood for a thousand years, regarded with reverence and wonder, until earthquakes finally shook it into ruins about the year 1400. It was built by order of the widow of King Mausolus, to preserve the name and glory of her husband, who had been a great man. Artists, architects, and sculptors from Athens worked on the beautiful structure. A square base of marble surmounted by rows of columns, then a tall, steep pyramid; and on top, one hundred forty feet above the ground, an enormous, wonderful marble chariot, drawn by four marble horses, and in the chariot marble figures of the King and Queen, half again as large as life size. So impressive and wonderful was this structure, that one of our words of today comes from it. Any tomb or monument of magnificence and splendor is called a mausoleum, after the tomb of King Mausolus, at Halicarnassus.

Almost two thousand years ago, the city of Petra was carved out of solid stone. In a barren wilderness, the wildest mountain country of Arabia, in a hidden valley whose only approach is a long, narrow slit through the rocks, were built temples and tombs of surpassing beauty. Legend has it that most of the work was done by jinns, or genies, controlled by a magic ring worn by the King who conceived of the place. Perhaps they did; it seems incredible that mere human beings could have carved the enormous rooms deep into the rosy-red sandstone cliffs. From Athens were brought the artists who covered the whole construction with marvelous, delicate carving.

The Colossus of Rhodes is another of the wonders of the ancient world, which would be regarded with equal appreciation if it existed today. It was built around 300 B.C., and was felled by a severe earthquake after standing for only fifty-six years. Only half a hundred years it stood, yet its fame has come down through the many centuries since that time, demonstrating how remarkable the stupendous statue must have been. It was supposed to have been an image of Helios, the sun-god. The people of Rhodes had it built to celebrate the triumphant ending of a siege of their city, and they used the bronze war machines of their enemies as the material for the giant struc-

ture. It was placed at the entrance to their harbour. The Colossus was one hundred and ten feet tall, and stood on a fifty foot pedestal. The enormous bronze body was hollow, and inside it a winding stair went to the top. Beacon fires were built up there, and the light from these fires shown through the great eyes of the figure, welcoming ships into the harbour.

Nebuchadnezzar, King of Babylon, lived a very long time ago, somewhere around 600 B.C. But he caused to be built a structure which, though long since reduced to ruins, is still a delight to the mind's eye. Nothing in today's world compares with the Hanging Gardens of Babylon. The gardens "hung" along a series of terraces built high up into the sky, as high as a thirty-story building. Upon a great pyramid of terraces were placed many tons of rich earth. Tropical trees, vines and flowers were planted until the whole became a garden of surpassing beauty. Upon the topmost terrace was a huge tank. Water was pumped from the Euphrates River into this tank, then allowed to flow downward across the terraces, or dropped as artificial rain through a sprinkler system. Inside the structure of this marvelous garden was the home of the King and Queen of Babylon.

And then, the Pyramids! Centuries have made only superficial changes in these amazing structures. They have stood solid and unshaken through thousands of years. The manner of their building, the mystery of their purpose, the permanence of their construction, without precedent through the ages, confounds architects, mathematicians, astrologers, and the rest of us, as has been the effect of the Pyramids for many centuries.

And consider now the Taj Mahal. This is not comparable in antiquity to the other structures mentioned, having been built only about three hundred years ago. But it is considered the most beautiful building ever constructed, in any age. If it is possible for an apex of perfection to be reached, the Taj Mahal is at that high peak. The story of its building is one of the great romances of the world. Shah Jehan, an emperor of India, had it built in memory of his dead wife. Many years were spent, enormous sums of money, and the highest skills of the greatest artists in the world. The Emperor's grief and desolation filled him with a burning desire to have this monument to his beloved portray all her beauty, delicacy, grace and radiance, to be in fact the spirit, in stone, of his Arjemand. And it was so accomplished. Purest ivory-white marble, some of it carved into delicate lace-work, makes the platform, the building itself, the swelling dome. The setting for this magnificent monument, trees, flowers, grass and pools of water, is as harmonious and lovely as the beautiful tomb which it frames and adorns.

Mildred Murdoch

The MONSTER

By S. M. TENNESHAW

**What will cosmic rays do to a living organism?
Will they destroy life, or produce immortality?
The eminent Dr. Blair Gaddon thought he knew . . .**

FRED TRENT pulled his coupe into the curb and leaned his head out the open window beside him.

"Hi, Joan, need any help?"

He called to a trim looking girl in a nurse's uniform. Joan Drake was holding on to a leash with both hands, and her slender body was tugging against the leash as she strained against the pull of a Great Dane on the other end.

She looked over her shoulder as Trent called out, her blonde hair glinting in the warm afternoon sunlight. Blue eyes smiled an impish greeting at him.

"Hello, Fred. No thanks. Brutus and I get along famously."

Trent opened the car door and got

out. He walked up the sidewalk and stood beside the girl.

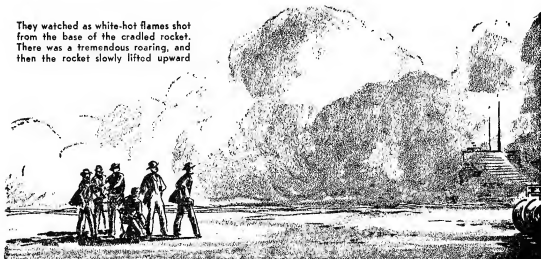
"Business must be mighty slack for the great gland specialist, Stanley Fenwick. Is this all he can find for his pretty nurse to do?"

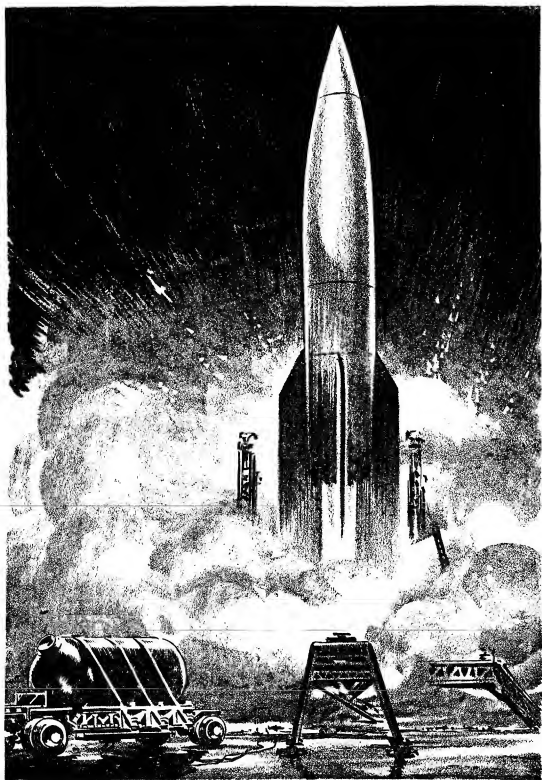
The girl sniffed. "Walking Brutus around has its compensations. At least he doesn't get fresh—like some people I know."

Fred grinned as he saw the huge dog suddenly turn on its leash and raise itself off the ground to stick out a long rapier-like tongue and lick the girl's cheek before she could move her head away.

"Down, Brutus! Down!" she called

They watched as white-hot flames shot from the base of the cradled rocket. There was a tremendous roaring, and then the rocket slowly lifted upward





out, half-laughing.

Trent stepped in and pulled the big animal away from the girl, patting the dog's head as he did so.

"What was that you said about getting fresh?" Trent asked her. "Looks to me like the dog's life is the best around the Fenwick offices."

"Just don't get any ideas!" Joan Drake shot back.

"I've already got them," he replied. "Which reminds me, am I seeing you tonight?"

The girl held a tight grip on the leash and looked at him coily.

"Let's see. We'll take in a movie, stop for a bite to eat at Joe's Hamburger Palace, and then drive out to North Butte. You'll park the car and then you'll ask me when I'm going to quit my job and settle down raising a family for you, and I'll say—"

"You'll say not until I get the biggest scoop in Arizona, a big raise, and a bonus as a down payment on a house," he completed her sentence.

"There! You see? We might just as well not have our date. In effect, we've had it already."

He looked at her for a long moment, and when he spoke again his voice had lost its humorous note.

"You forgot one very important item. When I ask you that usual question, and after you give your usual answer, I'll take you in my arms and tell you how much you mean to me, and—"

"You win," she interrupted him. "I had forgotten about that."

THE dog started to pull against the leash again and Fred reached out to help her hold the big animal in check. Then she looked at him again.

"What brings you to the outskirts of Tucson? Don't tell me there's a big story breaking on the edge of town."

He shook his head. "Not exactly. I'm on my way to the Rocket Research Proving Grounds. Just a routine story on the experiment they're going to pull off this evening. I've got to interview Mathieson, Gaddon, and a few other scientists on the project."

The girl laughed. "That's something of a coincidence. Dr. Blair Gaddon is in Dr. Fenwick's office right now."

Fred Trent's eyebrows raised in surprise.

"That so? Something wrong with him?"

"No. He's just having a physical checkup. Seems to be worried about his heart. Dr. Fenwick didn't need me since it's a routine job, so I took Brutus for a walk."

Trent nodded. "That's a bit of luck. I think I'll stick around and give Gaddon a lift out to the Proving Grounds. I wanted to talk to him anyway."

"In that case," the girl replied, "you can give me a hand putting Brutus back in his kennel. Once he gets out he's something of a problem."

Fred nodded, taking the leash from her hands and feeling the big dog tug against him.

"Never could figure out why Fenwick wanted a big hound like this. Seems to me a terrier would be more practical."

"That's a matter of taste," Joan answered. "Dr. Fenwick is very fond of Brutus—and so am I for that matter. But tell me something about this experiment you're covering."

They had turned in at a large Spanish type house that Trent knew served as a combination living quarters and office for the famous gland specialist. He shrugged.

"Don't know much about it myself. They're shooting off this new type rocket, a really big affair, loaded with all sorts of instruments. Some sort of experiment with cosmic rays. The rocket

will go up to the outer layers of the Earth's atmosphere, where a clocked mechanism will release a parachute attached section containing the instruments. This will float back to the surface of the Earth.

"There is one interesting thing about it though. They're also including a live animal with the instruments. A cat I believe. They want to see what effect the cosmic rays will have on a living creature."

The girl turned a shocked face toward him as they walked up the steps to the front door of the house. Trent could see a panel in the center of the door that opened from the inside, and over it, the sign, *Doctor is in, please ring.*

"But I think that's positively cruel!" Joan Drake said earnestly. "Subjecting an innocent animal to what may be certain death!"

Fred laughed at her concern. "Hold on, now. You should be the last one to take such an attitude. Doesn't medical science experiment on animals to find out about human ailments?"

"That's different," the girl insisted, opening the door and leading the way into a long hall. "Doctors know what they are doing—but this is a sheer waste of life . . ."

TRENT let the dog pull him down the hall toward a door at the end which he knew opened on the backyard where the Great Dane was kept.

"Seems to me it's much the same thing," he answered her. "Scientists want to explore the mysteries of space, and the only way to do it is with an animal. Or would you like to make the trip—maybe I can arrange it. Would make a big story, just the one I've been waiting for."

"I believe you would at that!" she mocked, opening the rear door. "Here,

give me the leash."

Trent handed over the leash to her and watched as she released the huge dog. Brutus flicked out a long tongue once again and caught the girl's cheek in a wet caress before she straightened.

"Brutus! Now get along with you!"

The dog took a leisurely bound through the door and into the backyard. Trent glanced through the door at the tall fenced-in yard with the large kennel that might well have served as a small garage. He stood beside the girl watching the big animal romp for a few moments, then she shut the door and they turned back down the hall.

"I'll have to go inside now, Fred," she said. "If you want to wait for Gaddon, have a seat. It shouldn't be long."

She started to turn in at a door marked private, when Fred pulled her gently around and before she could stop him, had kissed her.

"I was getting mighty jealous of Brutus. Now I feel better."

"I don't know which of you I prefer," she shot back, then smiled and pulled away from him.

He watched her open the office door and close it after her.

HE HAD lit his second cigarette and gotten halfway through his third magazine on the rack beside the chair when the office door opened again. He heard the pleasant voice of Dr. Stanley Fenwick.

"If every man had a heart as strong as yours, Blair, we wouldn't need half the doctors we have."

Then he heard the deep, gruff voice of Dr. Blair Gaddon half laugh.

"Thanks a lot, Fenwick. You've taken a load off my mind. Goodbye, Miss Drake."

He heard Joan reply and then saw Dr. Fenwick usher the physicist out into the hall.

Trent rose as the two men approached.

"Why, hello, Trent," Dr. Fenwick said.

Trent nodded at the tall, white-coated figure of the famous gland specialist.

"Afternoon, doctor."

Fenwick smiled at him. "Don't tell me you're waiting to see me?"

Fred shook his head. "Not exactly. I was waiting to see Dr. Gaddon though. I was on my way out to the Proving Grounds and I happened to stop by and talk to Miss Drake." He turned to the physicist, a bulky man with firm, hard features, who moved his large body with an almost cat-like grace.

"I hope you don't mind, Dr. Gaddon. Possibly I can give you a lift back out to the Base. I'm covering the launching for my paper."

Gaddon smiled at him. "But of course I don't mind. And I'll take you up on that offer. It'll save me a trip back to town to take one of the staff cars."

THE words had a friendly note to them, as did the smile on Gaddon's face. And yet, somehow, Fred Trent found that he did not like this man. It was nothing he could put his finger on, nothing he could rationalize, unless it was the coldly calculating look in the scientist's eyes.

"That's fine, doctor," Trent replied. "Shall we go?"

He turned and said good-bye to Fenwick and passed a smiling glance at the girl. He could see her blush slightly as Fenwick caught the glance and laughed. Then they were out of the house and Trent led the way to his car.

Inside, he started the motor and drove away. Beside him, Gaddon lit a cigar and blew a long plume of smoke through the open window.

"You said you wanted to talk to me,

Trent?"

Fred nodded. "That's right, doctor. I'm writing up the rocket experiment for my paper, and I thought maybe you could give me a few details of interest." He paused for a moment, then asked: "Would it be too personal to ask if your visit to Dr. Fenwick had anything to do with the coming experiment?"

Gaddon shot a quick glance at him. "Why do you ask that?"

Fred Trent shrugged. "It was just a thought. I heard Dr. Fenwick talking about your heart, but you look pretty healthy to me, so I thought maybe it was because Fenwick is a gland specialist and you might be talking to him about examining the cat after the rocket returns . . ."

Gaddon laughed roughly. "A mighty clever reasoning, Trent, but not quite correct. The fact is, I was seeing the doctor for personal reasons. Just a physical checkup. It had nothing to do with the rocket experiment or the effect of the cosmic rays on the animal we're including in the experiment."

"It was just a thought, doctor," Trent replied, as he moved the coupe out on the open highway away from Tucson and toward the Rocket Proving Grounds on the desert flats in the distance.

"So now that we've disposed of that, what else would you like to know?" Gaddon asked him, a peculiar edge to his voice that Trent did not miss.

"Well, I would like to get a first hand bit of information on just exactly what you plan to prove with this experiment. If I'm correct, Dr. Mathieson, the head of the project, contends that cosmic rays may be lethal, and this experiment is to prove his point."

The physicist snorted. "It is no secret that Mathieson and myself disagree violently on that subject."

Trent's eyebrows raised. "Is that so? I wasn't aware of it?"

Gaddon paused, seeing that his words had slipped out too freely. Finally he said, "What I meant to say, Trent, is that up until now it has not been a public issue of disagreement. And I would prefer to have it remain a private matter until after the experiment."

"I see." Trent mused. "You have my word that I won't print anything you say without your permission. But just what is the difference of opinion between you and Mathieson?"

Gaddon took a long pull at his cigar and waited a few moments before replying. It was apparent to Trent that he was debating continuing the subject with a newspaperman. But Trent had gauged the man correctly. There was a flair of vanity in Gaddon that dated back to his English ancestry. Trent remembered that Gaddon, quite a figure in English scientific circles, had created a stir when he had come over to the United States to assist in rocket research at the Arizona proving grounds. It seemed that Gaddon had not wanted to take a back seat to the famed American scientist, Mathieson. It had made a few gossip columns in the newspapers before Washington put an official clamp on the matter.

NOW, as Trent waited for the Englishman to reply, he could almost sense the thoughts that were going through Gaddon's mind. The Englishman was debating whether to take an open stand against the viewpoints of his American colleague. But Trent felt that the British stubbornness in the man would make him reveal his own theories. Especially since Trent had already promised not to print anything without Gaddon's permission. That would give him an opportunity to gloat safely, should his own ideas be proven

correct.

"Very well, Trent, I'll take you at your professional word to keep this matter confidential. But if what I contend is correct, you'll have a big story to tell."

Trent waited expectantly, not wanting to break the Englishman's train of thought.

"The fact is, Trent, that Mathieson is all wrong. To go even further, most of your American scientists don't have the haziest idea of exactly what the cosmic rays are. We in Britain have made quite exhaustive studies of the phenomena."

Trent didn't bother to argue with him. He only nodded his head. It would have been silly, he knew, to contradict Gaddon, to tell him that the English didn't know a thing more about the cosmic rays than the American scientists, that American science had made, and was continually making, exhaustive research into that scientific field of study on as great if not more so a scale than Britain could possibly achieve. It was only Gaddon's vanity talking, Trent knew, so he let him put in the barb of ridicule, waiting.

"I was sent over here, as you may know, to aid in the current experiment. To formulate it as a matter of fact. This test is being conducted to determine just what effect cosmic rays will have on a living organism. As I said, Mathieson, and your other scientists are of the opinion that the rays are lethal. That they will destroy life. In effect, that they are death rays.

"But I contend that they are wrong. What would you say if I told you that cosmic rays are the very source of life and energy in the universe?"

Trent whistled judiciously, and noted that Gaddon's face smiled at the apparent surprise Trent evinced.

"You find that a startling state-

ment?"

Trent nodded. "I'd say that it sounded like the beginning of a very interesting theory."

"And you would be right," Gaddon replied, warming to his subject. "It is my contention that the cosmic rays will prove to be the fountain of youth that men have sought through the ages. That they will react on the glands of a living creature and produce immortality."

"Now take your choice. Whose theory would you rather believe? Mathieson's idiotic claims of a death ray, or mine as a source of the utmost benefit to science?"

Trent took a moment before replying. When he did so, he spoke with tact, and also with the feeling that his trip to Fenwick's office had proven very valuable. For there was a story here. A big story.

"I'd say, doctor, that I'd like to believe your theory was correct. But isn't it a little premature to be so definite about it?"

Gaddon snorted. "No more premature than Mathieson's. And I'll tell you something else, Trent. You may not realize it, but you're about to take part in what may be the biggest story of the century. And when it breaks, you'll remember our conversation here. I intend to prove that your American scientists are wrong."

Trent noticed the personal emphasis that Gaddon put in his last statement, but he was drawn away from the conversation as he turned the coupe into the guarded entrance to the proving grounds.

There was a moment of credential flashing to the guards, and a respectful salute to the scientist in the car beside Trent. Then Trent moved his coupe through the entrance and up the cement roadway to the Administration building.

As Gaddon got out of the car he turned to Trent.

"I'll leave you here. The members of the Press will be conducted to the launching site at dusk. I'll see you then. In the meantime, don't forget that you've given your word not to release any of the information I've given you."

Trent nodded and watched him walk away. He followed the Englishman with his eyes, a frown crossing his face. There was something too cocksure about the man. His ridicule of American scientists could be ignored, but the way he spoke about his theory, as if it had already been a proven fact against the ideas of Mathieson. . . .

A faint chill ran up Fred Trent's back. He couldn't explain it. But it was there. An ominous note of foreboding.

He shrugged it off and left his car to walk toward the Administration building.

THE remaining hours of the afternoon dragged by in a monotony of idle speculation. Trent listened to the gathered newspapermen discussing the coming experiment at dusk, accompanied them as Dr. Mathieson, the head of the project, conducted them on a tour of the project, to the launching site, and then back to the central building.

The launching site itself had been an impressive sight. The huge rockets, much in appearance like the famed V2 of World War II, but on a much larger scale, were cradled in their launching platforms like some huge monsters about to be unleashed into the unsuspecting heavens.

They had listened as Mathieson explained the various number of instruments that were being included in the first rocket, to record its hurtling trip through the atmosphere to the outermost layers of the Earth's surface.

And they had been told of the other,

and to the gathered newspapermen, the most interesting part, the inclusion of a cat in the rocket, in a large oxygen fed chamber, to study the effects of the cosmic rays on a living creature.

Then back to the central building. Back to wait. And the tension began to mount. For the shadows were lengthening, the sun sinking behind the horizon to the west. The moment was now close at hand.

A STOCKY figure detached itself from the shadows beside the huge bulk of the laboratory building and slowly edged out into the dusk.

It paused momentarily, to survey the scene. Sharp eyes scanned the looming rockets and their launching platforms, watchful, alert. They finally settled upon the armed guard who walked a measured distance back and forth in front of the rockets. Then the figure moved forward again, cautiously, purposefully.

The distance from the giant rockets shortened gradually, and then the guard, turning to retrace his steps, saw the approaching figure.

There was a snapping sound as a rifle was brought into position, and a rapping command barked out.

"Halt! Who goes there?"

The shadowy figure halted abruptly a short distance away from the guard. And a voice answered.

"Dr. Blair Gaddon."

The guard's rifle snapped into present arms and then back to the soldier's right shoulder.

"Oh, it's you, sir. Is there anything wrong? The launching is set for fifteen minutes from now, isn't it?"

Gaddon walked slowly up to the soldier and the guard could then see his face in the thickening shadows.

"That's right," Gaddon replied. "I'm making a last minute inspection."

The guard nodded. "Dr. Mathieson and the newspapermen will be along any minute, sir?"

Gaddon moved closer to the soldier, and then suddenly his hand came out of his coat pocket and there was a gun in it.

"Drop your rifle, soldier. Quick!"

The guard stared at the scientist in shocked astonishment.

"What is this, sir? A gag?"

Gaddon motioned with his gun.

"It is no gag! Do as I say—or must I shoot?"

THERE was an ominous note in Gaddon's voice. And a strained quality to it that told the guard the man meant what he said. Very slowly the soldier removed the rifle from his shoulder and dropped it to the ground.

Gaddon motioned with his gun.

"Now step back! Move!"

The guard moved slowly back a pace, and then the Englishman stepped forward and kicked the rifle away from the man. Then he motioned around the rocket.

"Now move over around the side of the number one rocket to the far side of number two."

He watched as the guard turned and began to walk slowly around the huge base of the waiting rocket. He followed the soldier.

"I don't know what this is all about, Dr. Gaddon," the guard protested. "But I can tell you one thing, you're playing with the United States Government right now. When Dr. Mathieson hears about this—"

"When Dr. Mathieson hears about this, soldier, I'll be a long way from here—out at the edge of space itself!"

Gaddon could hear the guard draw in his breath sharply, but the man kept walking around to the far side of the second rocket cradle.

"You can't mean that you're going to go up—"

The soldier's voice broke off uncertainly and Gaddon laughed shortly.

"You are a discerning man, soldier. That is exactly what I intend to do. And I warn you, don't make a false move or I'll shoot. My plans are made and I intend to carry them out!"

They had reached the far side of the second rocket now, away from view of the rest of the buildings, out of sight. Away in the distance the faint outlines of the great wire fence circling the testing grounds could be seen, and beyond that, the twinkling lights of Tucson, already visible in the dusk.

"This is far enough," Gaddon said suddenly.

He watched as the soldier halted. Then Gaddon moved up quickly behind the man. Before the soldier sensed what was about to occur, Gaddon's hand raised over his head and the butt of the weapon in his hand crashed against the back of the man's head.

There was a soft groan in the shadows as the soldier crumpled limply to the ground. In the silence that followed, Gaddon's tense breathing was the only sound. He looked down at the still body of the unconscious man, then he quickly turned and retraced his footsteps back the way he had come.

When he had reached the far side of the first rocket, he stopped before the metal steps of the cradle leading up to the closed door of the rocket. He looked quickly about him, making sure that nobody was in close proximity, then he threw his gun under the rocket beside the rifle of the soldier, and ran up the steps.

A cool breeze sprang up in the western night and whispered softly around Gaddon as he fumbled for a moment with a switch set in the smooth side of the rocket beside the sealed door.

There was a click, finally, and the door slid open.

Gaddon took a last look about him and then quietly slipped through the opening. A moment later there was the sound of the door sliding shut.

Inside the rocket, Gaddon lit a small pocket flash and looked around him. A soft sound struck his ears. The mewing sound of a cat. He turned the flash on the startled animal and a low laughter crept from his throat.

He moved through the large instrument chamber then and sat on the floor beside the cat.

Then the flash went out and his laughter came again . . .

"ALL right, gentlemen, the time has come. In a few minutes an automatic control, synchronized with controls in the rocket will be set off in the main laboratory building. If we want to watch the launching we'll have to hurry."

Fred Trent listened to the voice of Mathieson, and saw the famed American scientist start out of the central lobby toward the launching site. The gathered newspapermen followed, their voices filled with excitement now that the moment had come.

Trent followed along with them, but felt a peculiar tenseness within him. He had been watching for Gaddon to make his appearance. But as yet the Englishman had not showed up. Was it possible that he wasn't going to watch the rocket launching? As Trent followed the others out into the gathering night, he frowned to himself. It was certainly strange. And entirely unlike the blustering manner Gaddon had displayed on the drive back from Tucson. Or had the man suddenly realized that he had made a fool of himself and was taking this easy way out?

But that too didn't seem natural. And

Trent found himself edging forward through the ranks of the newsmen, until he had reached the side of Mathieson.

The scientist was talking to one of the journalists as they rounded the corner of the Administration building. Now the rockets were in sight, standing tall and immense in the shadows.

Mathieson held his hand up in a gesture of halt, and the men behind him drew into a compact circle.

Fred turned to Mathieson.

"Dr. Mathieson, isn't Dr. Gaddon going to be here for the launching?"

The head of the rocket project turned to Trent. Fred could see a suddenly puzzled look in his eyes.

"Yes, that is strange . . ." Then he laughed. "I suppose Gaddon is in the laboratory supervising the firing controls. Well, if he wants to miss the show, that's his fault. He knows the schedule."

Trent accepted the scientist's words without replying. But he still wasn't satisfied. What was it that Gaddon had said in the car about the biggest story of the year? What had the man meant? Question after question arose in Trent's mind as he stood there, and always the queer feeling inside him grew in intensity. He could not place his finger on it, but somehow, he knew that something was wrong.

But then his suspicions were put aside for the moment as he heard Mathieson say:

"All right, gentlemen, the time is nearly here. In precisely one minute the rocket will be fired."

The statement was made with a quiet eagerness, and then suddenly the gathered witnesses grew silent.

Trent's eyes, along with the others, fastened on the looming bulk of the waiting rocket.

And the seconds ticked off in Fred's

mind.

As he counted them, he thought that it seemed impossible that within a very few moments that gigantic hulk of smooth, tapered metal would dislodge itself from the cradle it rested in with a burst of roaring flame. That in another few seconds it would shoot into the blackened sky, and in a few short minutes would reach unbelievable heights in the heavens, to the edge of space itself before the automatic controls released the instrument section to be returned safely to earth.

And the seconds passed.

"Time!"

Trent heard the voice of Mathieson rap the word out sharply.

And then there was a roar of sound from the cradled rocket.

A spear of flame shot from its base, exploding the night into a brilliant display of pyrotechnics.

THE roaring grew louder as the tremendous power of the now unleashed rockets took hold of the night air. Fred watched as the flames grew white-hot bright, and then he saw the gigantic rocket shudder in its cradle.

The shudder grew into a spasm of movement, and then slowly, but steadily growing faster, the rocket lifted from its cradle.

Fred's eyes were fastened on the rocket now, a feeling of awe sweeping through him. He suddenly realized how puny man was against the forces man could unleash. Forces that here were being utilized to scientific ends, but forces that upon a moment's notice, could in turn be unleashed upon the rest of humanity in a burning, devastating terror of death.

And as the thought flitted across his mind, he saw the rocket gather speed as it left its cradle. It was now rising in a swift, sure arc, lashing into the

dark sky like a fury.

And then the terrible speed of the rocket took hold against the forces of gravity and it shot into the heavens, its roaring becoming a fading hiss of sound, the brilliant flash of flame from its exploding tubes, a receding beacon of light that gradually faded to a pinpoint far over their heads.

After the terrific thunder of sound that had accompanied the launching of the rocket, the sudden silence now was almost palpable. The gathered witnesses stood mutely, awe still in their eyes, their ears still ringing with the sound of the takeoff.

Finally the voice of Mathieson broke the quiet night air.

"Well, gentlemen, that's it. Tomorrow morning we'll scout the returned section. It should land somewhere in the open country to the South. We've computed that pretty carefully. I guess that's about all for—"

His voice broke off suddenly and Fred Trent heard what must have distracted the scientist.

A man was shouting from the vicinity of the second rocket, and as they looked, a dim figure could be seen staggering away from the side of the other rocket, coming slowly toward them.

"Good Lord!" Mathieson breathed. "What's that man doing out there? He could have been killed!"

Then suddenly they saw the staggering figure stumble on the ground.

And then Trent and the others were racing across the ground to the side of the fallen man.

When they reached him, Mathieson came forward and knelt beside the figure.

"Why, it's one of the guards!" he said in shocked surprise.

And it was then that the strange feeling of foreboding hit Fred again. As he knelt beside the groaning guard, it

swept over him in a chilling wave. He lifted the man's head from the ground and the guard opened his eyes. He recognized the face of Mathieson as the scientist looked anxiously in his direction.

"Good heavens, man, what happened? You were ordered to leave five minutes before launching time!"

The guard's mouth opened as he struggled to a sitting position. The man's hand reached up and touched the back of his head painfully.

"Sir—Gaddon—Dr. Gaddon attacked me . . ."

There was a momentary stunned silence as the soldier's words sunk in on the gathered men.

"What?" Mathieson's voice was incredulous.

And as Trent watched the soldier nod his head, the suspicion he had felt suddenly overwhelmed him in a grim realization. Even as the soldier blurted out pain-filled words, Trent knew somehow what he was going to say.

"Gaddon—he pulled a gun on me . . . He forced me to the far side of number two—he said he was going up in the rocket—he said he had plans—then he hit me with the gun . . . I came to when the rocket went off—I was away from the blasts, luckily . . ."

Then the soldier was standing on his feet again, swaying as he fought to clear his fogged senses.

But Trent was no longer aware of the soldier. And he saw that Mathieson was no longer looking at the guard. For a brief instant their eyes met, and Trent saw a stunned look in the scientist's, then Fred's gaze swept up into the night. Up into the darkened sky where, miles above them, the hurtling rocket was even now reaching the apex of its flight.

Up where a man rode on a perilous trip into the unknown.

GADDON hunched in the darkness of the rocket, waiting. He had counted the remaining minutes off, one by one. And he knew that finally the moment was at hand.

It would be too late now to stop him. They had not noticed his absence, and if they had, they would not delay the launching for him. He had taken that fact into consideration.

And now that the moment was close to completion, he felt a glowing sense of triumph within him. He would now show those fools, and especially Mathieson. He would prove conclusively that cosmic rays were what he had said they were—a source of the energy of life, a fountain from which youth and vitality would pour, making his body immortal. He would go down in history as one of the greats of science. A man who had risked his life to prove his theory. A man who would be the first to achieve the goal of the ages, the dream of the philosophers, eternal life.

The triumph would be his. *All* his!

And the rocket tubes exploded into sound.

Gaddon tensed in the darkness, gripping the safety straps he had attached to himself. Beside him he felt the cat let out a frightened mewing sound as the roar of the exploding rocket power grew. He felt the furry body rubbing against his side, seeking sanctuary against this dread sound.

And then the rocket trembled with sudden movement.

It was slow at first, but then it grew faster, and Gaddon felt a faint intensity of fear in his temples at the shuddering power of that movement.

And then he felt the blood draining from his head, making him faint with dizziness as the rocket accelerated suddenly into a terrible burst of speed.

He could feel it moving swiftly through the atmosphere now, feel the

tortured rush of air that whipped against the sides of the projectile in a moaning dirge that mingled with the roar of the exploding rocket fuel.

And as the seconds passed, he became accustomed somewhat to the increasing velocity of the projectile, and the dizziness passed from his head. Then he became aware of the trembling body of the cat beside him and a soft laughter rose in his throat.

But it died stillborn as the roar of the rockets grew to a thundering hiss now in his ears.

And he felt the cool sweetness of the automatically released oxygen fill the chamber about him and he drank it into his lungs hungrily.

With each second now, he knew the projectile was racing higher into the rarefied atmosphere, heading steadily out to where the air of earth would be almost non-existent.

And a grim smile crossed his face in the darkness, for he knew that shortly the rocket would enter the outermost layers and the cosmic rays would play with all their energies upon the projectile.

And he tensed suddenly.

There was a glow that sprang into being in the chamber about him.

It was dim at first. But it grew steadily in intensity around him, revealing the interior of the chamber in its weird light.

An exultation swept through him then. He knew they had entered the field of the cosmic rays, and that the manifestation of light he saw was a result of those forces of nature.

Beside him the cat mewed plaintively in fear and huddled closer against Gaddon's body. His eyes watched the tiny creature for a moment and then swept around the large chamber at the massed instrument panels that were recording every minute fraction of a second of the

flight.

And the glow grew.

And suddenly the hissing of the exploding rocket fuel began to diminish in volume. The apex of the flight was nearly at hand then.

And the glow around Gaddon began to color. From a weird phosphorescent whiteness it changed to a dull but intense yellow. And with the change, a strange feeling crept through his body.

IT TUGGED at him with invisible hands. It played upon his every nerve, his every fiber, the innermost feelings of his sensibility. It grew stronger, this alien probing within him, grew as the glow pulsed in the chamber around him.

And suddenly, instead of a fierce feeling of triumph, a sense of dread swept through him. He fought at the gripping sensations within him, tried to dispel them, to no avail. They grew stronger, like invisible hands that were changing the very essence of life inside him.

And as the thought passed through his suddenly tortured mind, he realized that was exactly what was taking place. A change. A change beyond his comprehension, beyond the understanding of any man. Beyond—

And the whining fearful mew of the cat beside him changed. It tensed against his body, and the whine in its animal throat became an irate hiss. He looked down and saw the hackles rising on the back of the cat, saw the creature looking up at him now, not with wide frightened eyes of appeal, but with a ferocity of wildness that brought a chill to his inner being.

And the glow grew around him, brilliant yellow in texture now. And with the increasing brilliance of the light, the feeling of change grew within him.

It was stronger than he now. It held his every heartbeat in its pulsing grip.

It throbbed in his temples, ached to the ends of his toes, set his body aflame with it.

And the cat suddenly lunged against him, its sharpened claws biting through his garments and into his flesh.

His hands reached down in a quick movement and gripped the body of the cat. He tore the raking claws away from his body and held the cat in the air beside him.

The creature writhed in his grasp, fighting madly to escape. And as his grip tightened on the animal, the eyes of the cat suddenly locked with his.

He felt the forces within him reach a crescendo at that moment. And his body was frozen immobile, his eyes locked on the cat's eyes, burning into the animal, the animal burning into him. Burning and burning . . .

It could only have been a matter of seconds he knew. But they were seconds that stretched into the farthest reaches of eternity. Seconds that lived a million years and passed in another fleeting instant.

And then he could move again.

And he felt strange as he moved. It was as if he was another person, as if the body he moved was alien to him, as if it had never belonged to him, to any man, to any thing.

And his eyes tore away from the now dulled expression in the cat's eyes. He did not find it strange that this was so. He knew in some inner sense that the mighty life force in him had quelled the cat. Had stilled the fighting in its feline eyes.

And he saw his hands clutching the body of the cat.

He stared at them for a long disbelieving moment. For they were not the hands he had known. They were not the hands of Blair Gaddon. They were not the hands of any man. They were long and tapered and claw-like. There

was dark fuzzy fur around them, fur that was cat-like.

Deep within him a fear struggled upward through his mind. A cold dread that forced his lips to move, to utter a gasp of the terror he felt.

And the sound left his lips.

It left his lips and echoed terribly in his ears. A harsh sound. A mewling sound. *A cat sound . . .*

The creature in his grasp struggled feebly then. It was a small movement, a movement without vitality, almost without life. And as the creature moved, a sense of rage welled up inside him. A rage that he could not control, an anger that he wanted to unleash to its fullest. And as it took possession of him, the human part of his mind shrieked and forced words from his lips.

"You fiend! You fiend of hell!"

And his fingers crept up to the neck of the cat and closed in a mighty grip. He felt the animal give a single desperate effort in his grasp, but his grip tightened and he saw the mouth of the creature open wide and heard a faint hissing gasp as its tongue stuck far out and its eyes bulged in a last moment of life.

Then the animal lay limp in his claw-like hands and he dropped it to the floor of the rocket chamber, a growl of frustration leaving his lips.

He stared at the cat's body for a moment, then his fingers stole up and touched his face. He felt the hairy coarseness of it, the furry tingle of his once smooth skin. And he screamed into the now fading glow that he knew was the energy of the cosmic rays.

"No! No! It can't be true! I haven't changed like this! I—I—meowrr . . ."

Around him the thunder of the rocket fuel suddenly vanished into silence, and then the rocket gave a lurch.

Deep within his mind he knew that the instrument section had been released from the main body of the pro-

jectile, and even now he knew the sealed chamber was falling back toward the earth, back toward the atmosphere where the parachute would take hold and drift the chamber safely down to the Arizona soil.

And a dread closed over him in that moment. Back to the men. Back to the things of men. Back he must go, a mewling thing that was not a man. A thing that he felt was taking hold of him, driving the last vestige of human instinct from him.

He fought it. He fought it mewling on the floor of the rocket chamber.

"HE MUST have gone mad!"

Fred Trent pulled his gaze from the sky and looked with stunned eyes at the figure of Dr. Mathieson standing beside him. The scientist was trembling with an inner feeling, and his head was shaking in disbelief.

"Gaddon! The man is going to his death! It's insane!"

Again Mathieson's voice broke the silence in the huddled group of men. Then the newspapermen came to life and excited talk became a jabber of words around them. Trent took the arm of Mathieson and turned him. He tried to lead the scientist away from the newspapermen but one of them stepped forward and grabbed his arm.

"But why did he do it, doctor? The man must have had a reason!"

Mathieson shook his head numbly.

"I—I don't know, unless . . ." his voice trailed off for a moment and then he spoke again. "Unless he really believed what he said . . ."

"What did he say, doctor?" the newsman asked.

There was a puzzled note to Mathieson's voice as he answered.

"He disagreed with me on the supposed effects of the cosmic rays. It has been my contention that they are of

lethal effect, and Gaddon maintained that I was wrong. He kept insisting that they were a source of life energy. That was why we decided to experiment with an animal—to see what effect the rays would have on a living creature . . .

"But this! I never dreamed of such a possibility—to prove his point he signed his own death warrant!"

"That's a story, doctor, a real story!"

Trent heard the newsman exclaim excitedly. And then it came to him that the real story was as yet untold. The real story that had been unfolded in his car earlier that day.

Fred moved suddenly away from the clamor of the newsmen around the scientist. He knew what he had to do.

He hurried across the ground to his waiting coupe outside the Administration building. Then he got behind the wheel and started the motor.

He drove to the gate and waited until the guard passed him through, then he turned up the road toward Tucson.

As he drove he felt an odd tenseness sweep through him. For he was thinking of what Gaddon had said on the drive up to the Proving Grounds. He was remembering the man's words on the cosmic rays and the secret of eternal life they held. And Fred Trent knew that this was the biggest story. The story that he alone held. It was the big break that he had been waiting for. It would be his exclusive. The inside, personal story of a man who had died to prove his theory. Told as Gaddon himself had related it. With all the vanity of the man, all the pompous assurance he had shown. It would make the headlines and feature sections all over the country. The story of a man who had flown to his death in quest of immortality.

And then Trent's thoughts grew sober suddenly. But was he going to his

death? Could he be sure that Mathieson was right? That Gaddon was suffering from some streak of insanity that had manifested itself in this final venture of madness? Or could it be that Gaddon might be right, that . . .

Trent set his lips and sighed. No, that couldn't be true. It was beyond the comprehension of man.

What mattered now was the story. The story that would put his name in a thousand papers all over the country. And he thought in that moment of Joan Drake. A warm smile pulled at his lips as he thought of her. This would force her to quit her job now and marry him. The one condition she had made he had finally overcome.

He thought of the date he was supposed to have with her that evening. It would have to be postponed until later. The story came first. And then . . .

He drove his car swiftly through the outskirts of the city and into the main part of town. Then he pulled up before the offices of the *Tucson Star* and left his car at the curb.

HE ENTERED the building, took the elevator to his floor and walked into the city room. The clatter of typewriters met his ears and the sound was sweet to him in that moment.

He crossed swiftly to his desk and sat down. Then he motioned to a copy boy. The boy came up to his desk.

"Jerry, tell the chief to hold up the form on page one. I've got a special—an accident out at the Proving Grounds. Headline copy."

The youth hurried away toward the office of the City Editor, and Fred picked up his phone and dialed a number. He waited a moment and then the voice of Joan Drake came across the wire.

"Dr. Fenwick's office."

"Joan, this is Fred."

The girl's voice laughed across the wire. "Don't tell me you're planning to break our date? Just when I get all dressed up."

A smile crossed Trent's lips. "You're almost psychic, honey. Fact is, I was calling to tell you I'll be a little late."

There was a pause and when the girl spoke again there was an injured note in her voice.

"Well, that's a fine thing. I wait here deliberately after hours for you to pick me up and now you tell me you'll be late! Just what's so more important than me right now?"

"I haven't got time to tell you now, Joan, but believe me, I've got the break of the year. A story that will rock the front pages across the country. I'll tell you all about it later. You can wait at Fenwick's place. He won't mind, will he?"

He could hear the girl sniff on the other end of the wire.

"I don't suppose he will, but I don't think I can say the same for myself."

"That's a good girl," Trent laughed. "Just wait for me. It may be an hour or so—"

"An *hour* or so! What are you writing, the great American novel?"

He looked up and saw the frowning face of the City Editor approaching his desk. He spoke hurriedly.

"I've got to sign off now. The boss is coming up. I'll see you later. Give my regards to Brutus."

He replaced the phone as the editor reached his desk.

"What's all this about a remake on the front page, Trent?"

Fred nodded. "That's right, chief. The biggest story since the atom bomb. Listen!"

He gave a short account of what had happened, and then added the personal details of his talk with Gaddon. He saw the eyes of the editor widen as he

went on, and by the time he had finished, there was a look of excitement on the editor's face.

"Get to that story, Trent. Write it hot, and write it fast. I'll hold the first form and tear down the front page. Stress the human interest angle. Play it up big. We'll hit the news wires with it after we go to press."

Then a smile crossed the editor's face. "And you'll get a by-line on this Trent that ought to put you in for some big money. Nice work."

Then he turned on his heel and was hurrying across the city room toward his glassed-in office, hollering for a copy boy as he went.

Trent turned back to his desk and slipped a sheet of paper into his typewriter. There was a tenseness around his eyes as he brought his fingers down on the keys. For a moment the old questions rose again in his mind. *Was Gaddon right? Could it be possible that . . .*

Then he forgot everything but the story. And his fingers clicked against the keys, putting it down on paper.

THE rocket chamber swayed gently through the night air, whistling its way slowly downward, moving more slowly as the great parachute above it caught in the rapidly thickening density of the cabin's atmosphere.

Inside it, the thing that had been Gaddon, the thing that was no longer a man, sat on the floor of the chamber, idly toying with the dead body of the cat.

Strange thoughts coursed through the mind inside its head. Half of the mind that belonged to Gaddon, and half of the mind that was an alien thing, a creature unnamed.

There was a thought of killing and the thought was good. The claw-like hands played with the cat's dead body,

fondling it idly, wishing it were still alive so that it might die again.

And the other part of its mind, the part that still knew it was Gaddon, rebelled against the thought. Tried to drive it away. Tried to move that alien intelligence into the rear of his consciousness.

A growl left his lips as he struggled with it. And then a whimpering sound.

For now the alien thought of killing and the joy it had experienced as the cat died scant moments before, was replaced by another thought. A thought of loneliness.

It was a weird feeling, an utter loneliness that came from the great void beyond man's planet. It cried out in silent protest for it knew it was alone in this world of men.

And it knew it would remain alone, friendless. For what manner of men such as the other part of its mind showed would react in a friendly fashion? Where would be their common meeting ground? There could only be one, it knew. And that one was fear. Fear and the hate that went with it.

A growl left its lips again, and Gaddon's thoughts tried to force their way through. Tried and failed again.

But was it necessary to want companionship? It thought about that for a moment. And then the alien beast thoughts grew sharper, clearer. It knew suddenly that it did not want man's compassion. It knew that there was only one driving thought in it. Hate. Hate that would inspire fear. Fear that would freeze its victim into terror. And terror that would be replaced by death. And then it would be happy again. Happy to sit and fondle the thing that had been alive. And it knew something else. It knew that a hunger would have to be satisfied. A hunger that called for flesh.

Deep, primeval thoughts raced

through it then. Thoughts that were spawned in the ancient jungles of a new and steaming world. A world where great cats roamed, where screams of cat-rage split the air as tawny bodies arced in lightning leaps to land on the trembling bodies of their victims. It was a satisfying thought. A thought that spanned the ages of Earth, a sense that was inherent in all cat minds through the ages.

And as the thought raced through that portion of its mind, the part that was Gaddon struggled to fight it back. For it realized with a sickness that spread horror through it that the thought was part of the animal existence that had been created in him. Part of the monster that lay by instinct in all feline creatures. And Gaddon knew that the dead creature at his feet, the limp and twisted body of the cat, had died long before his hands had crushed it in their mighty grip. For the essence of that life, that animal existence, had been merged with him, fused by a mighty source from outer space.

AND as he struggled with the thought, fought to regain the balance of control of the strange body that was now his, the rocket chamber swayed in a gust of wind from without. And as he clutched the sides of the chamber with his strong claw-like hands, the chamber gave a bounding lurch as it struck the ground a glancing blow.

There was a grating sound as the metal chamber gouged into the earth, sank its weight upon the Arizona soil. And the thing was thrown violently against the side of the chamber.

Then there was quiet again.

Gaddon's mind fought to the fore, took control of that feline man-shape that was his, struggled to its feet and moved in a lithe bound to the opposite side of the chamber. A clawed hand

reached up where Gaddon knew the release mechanism of the door lay, and pressed it.

The door slid back with a sliding sound and the cool night air rushed in upon it.

Gaddon moved his cat-body through the opening and bounded to the ground in a lithe, powerful movement. He felt new muscles react as he landed on the ground, and knew that there was a great strength in them. Strength that was waiting to be used.

And he felt the other thoughts starting to move forward in his mind again and he forced them back. He knew he must keep control of that mind. For there was something that he must do.

He thought desperately about it. And the pattern became clearer in his mind.

The cosmic rays. The reaction in his body. He had sought immortality in the door to outer space and had found a monster waiting for him. A force that had changed his glands, grown the shaggy fur on his body. Glands that had warped his mind. Opened an age-old cunning of feline thought.

Glands.

Gaddon's thoughts whipped the word. Held it. Knew it must be the answer. And then it found a prayer of hope. And a name that went with that thought.

"Fenwick! I've got to reach Fenwick before it's too late. *Before it's too late!*"

His voice came hoarsely, strangely formed. And he looked wildly about him. He saw, off in the distance, a glowing of lights in the night. And he knew somehow that it was the city of Tucson.

And in that city, at its very edge, was a house he must reach.

He stumbled away into the darkness, feeling his limbs move rapidly then,

smoothly, covering the ground in great leaping strides.

And though Gaddon's thoughts kept the balance of control, deep inside his mind, the monster growled with a cunning laughter . . .

FRED TRENT pulled the last sheet of paper from his typewriter and leaned back in his chair exhausted. That was it, the end of the story. He waved his hand at a copy boy and the boy ran up to take the final page. Each sheet had been taken like that, to be immediately set in the composing room. Now it was finished, the story of the year.

And as Trent slowly lit a cigarette and inhaled deeply, he knew that he had done a good job on the story. And a smile crossed his face as he thought of it. His future was assured now. There could be no more stopgaps, no more delays in his plans to marry Joan and settle down. And the girl would have to agree. For the first time in many months, Fred felt that his troubles were over with. And the feeling was nice. It spread through him and he was content.

He glanced at his wrist watch and frowned. The story had taken longer than he had anticipated. It was nearly eleven. Some of the enthusiasm ran out of him as he thought of Joan waiting for him at Fenwick's. He could imagine how angry she must be by now.

He got up quickly from his desk and reached for his hat. As he started to walk away, the phone on his desk rang.

He stepped back and picked up the receiver.

"Trent speaking."

"Fred!"

Trent heard his name uttered in terror across the wire and he felt a chill run through him as he recognized the voice. It was Joan Drake.

"Joan, what's wrong?" he asked anxiously.

"Fred! Come quickly! Bring help before it's too late—he'll kill us!"

"Joan! For God's sake, calm down! Now what's the matter?" His voice held a tenseness in it as he spoke.

"It's Gaddon, Fred! Only it isn't Gaddon—it's a monster! He'll kill us!"

"Gaddon?" Trent's voice spoke incredulously. "But that's imposs—"

"Oh, Fred, hurry—I—oh—no—no! Keep away—"

He heard the girl scream over the phone then. And he heard something else. A growling sound. A sound of animal noise unlike any other sound he had ever heard. And then as he shouted into the phone: "Joan! Joan!" the line went dead.

He stood for a moment, staring stupidly at the receiver in his hand. Then he slammed it back on its cradle and turned. He nearly knocked over the copy boy who hollered at him.

"Hey, Trent, the boss wants you in his office!"

But he swept by the boy unheeding. He didn't wait for the elevator. He took the stairs in leaping bounds, and then he was on the main floor of the building and out on the street.

He slammed the door of his car shut and started the motor. His hands trembled as he meshed the gears and shot the coupe away from the curb. Then he was moving swiftly through the traffic.

As he turned down the street where Fenwick's office was, Fred Trent's mind was a whirl of confused thought.

There was fear there. Fear and dread. And there was puzzlement too. A puzzlement that made his brain spin. Joan had spoken with terror in her voice. Terror that had said somebody was going to kill. And Joan was not

a girl to be easily frightened. And she had mentioned Gaddon's name. Gaddon, the man who had shot into the heavens in an experimental rocket. Gaddon who was supposed to be dead.

HE FELT now that same feeling that had crept through him after the launching. The feeling that had whispered in his mind that maybe Gaddon had been right after all. That maybe he wouldn't die. That maybe . . . And now the dread swept him. For he thought of the sound he had heard over the phone. The last sound before the line went dead. The sound of an animal growling in wrath. And he remembered the girl's scream about a monster.

A cold sweat was on his forehead as he pulled the coupe into the curb in front of the Fenwick house. He switched off the motor and closed the car door after him.

Then he was hurrying up the walk to the front door, his eyes taking in the house in a swift glance, noting that the lights were lit in the consultation room. Lights that slivered out from the closed venetian blinds.

He stood then on the front porch, his hand closing over the knob of the door.

It was locked.

He pressed the bell then and heard its clarion sound inside the house. But other than that there was nothing to be heard. A deep, ominous silence that somehow brought a feeling of panic to him. Was he too late?

And then suddenly the panel in the front of the door opened and a face peered out at him.

Fred Trent felt the blood drain from his lips. A paralysis seemed to grip his body at what he saw framed in the opening.

For it was not the face of a human being. And yet, it was not the face of an animal. It was a horrible, twisted,

cat-like visage that peered out at him, furred and ugly, with bared teeth and glowing, feline eyes.

And as he looked, a sound came from the twisted lips. It was the same sound he had heard over the telephone. The sound of a growling rage.

And as the sound hit his ears, a terrible realization swept over him. For his eyes, riveted on that monstrous countenance, had registered an impossible fact upon his mind.

As twisted as it was, as horribly changed into an animal grimace, it was the face of someone he knew—the English scientist, Blair Gaddon!

And then suddenly the face vanished from the opening. And Fred Trent felt his paralysis leave him. He knew now that he should never have come alone. That he should have called the police first. That he—

The door swung open then and Trent found himself facing the thing that had been Gaddon.

He took a backward step and started to turn and run for his car and help, but he was too slow.

An arm shot out and a claw-like hand suddenly gripped his shoulder in a swift, steel-like movement. He felt himself being pulled forward and into the house, as another growl snarled from the lips of the creature.

Trent tried to break the grip of that vise-like hand. He tried to smash his fist into the ugly visage of a face that confronted him. But he was like a child in that grip. And like a child, he was hurled across the hall, and he heard the door slam shut behind him.

As he got slowly to his feet and turned to face the creature, he heard a sobbing sound from the open door of the consultation room. It was the voice of Joan Drake.

And then the monster had reached him and the clawed hand reached out

and spun him through the doorway, into the consultation room. And he heard a growling voice utter harshly: "You will regret this interference, Trent!"

And he knew that it was the voice of Blair Gaddon. And yet he also knew that it was not the same voice. It was changed. It had a bestial quality to it.

Then Trent looked around him. He saw Joan Drake, huddled in a corner of the room, beside Dr. Stanley Fenwick. The specialist was sitting in a chair, holding his right hand to his mouth. Fred could see blood oozing from a gash in the surgeon's lips.

AND then he heard another sound.

A sound from without the house, coming from the rear. It was the baying of Brutus. The big dog must have sensed the presence of the monster. And it was protesting in its animal voice, a mournful dirge.

Then his attention was drawn once again to the animal body of Blair Gaddon. And now that the first shock had left him, Trent stared at the man. He heard the girl sob.

"Fred! I told you to bring help—"

"Be quiet!" the voice of Gaddon issued from the twisted lips. And the girl's sob stifled itself in a look of dread.

Then the face that had been Gaddon turned to Trent. There was a twisted leer to it, and Fred sensed that there was a struggle going on in that warped mind.

"You are Gaddon? The Blair Gaddon who went up with the experimental rocket?" Trent's voice came incredulously.

The face of the creature twisted in a grimace of acknowledgment.

"Yes, Trent. I am Blair Gaddon. I am not a pretty sight to look at, am I?" Words left the twisted lips, and there was a bestial pain in them.

"But—you're supposed to be dead! Mathieson—"

A strange sound of irony came from Gaddon.

"Mathieson was right about the cosmic rays—I know that now. Look at me! You see what has happened to me? I sought immortality through the life energy of space—and look at me!"

Horror reflected in Fred's eyes in that moment. For he felt the pained terror in the voice of the animal shape before him. And he saw the claw-like hands clench spasmodically.

"My glands!" the voice screamed. "The cosmic rays reacted on them—fed the essence of the cat into them—changed me into this monstrous being!"

Trent stared at the rage-filled face. Felt the emotion that was sweeping through the creature. Felt a sudden compassion that was erased by the bestial look that came into the monster's eyes.

And then it turned toward the chair where Fenwick sat. The doctor was looking at the creature, his eyes wide and terrified.

"But what do you expect me to do for you, Gaddon? Why do you stand here threatening—" Fenwick's voice came hoarsely.

"Why? You fool! Because there is so little time! I am changing! Even now my human instincts are nearly gone! . . . You're a gland specialist! There is something you can do—stop this change—stop it!"

Fenwick shook his head slowly. "You're raving like a madman, Gaddon. I'm not a God—do you think I can change something that is beyond human understanding? If you'll only let me call in the authorities . . ."

A growl of rage left Gaddon's animal lips. "Authorities! So you can have me put in cage like a wild beast? So you and your medical experts can stand

and watch me as you would a freak? You're a fool! You'll help me now! You'll do something—before it's too late! Do you hear me?"

The creature advanced slowly upon the doctor, and the girl backed away to the far wall, fear mirrored in her eyes.

Then Fred Trent stepped forward, his voice tense.

"Hold on, Gaddon—of course the doctor will help you—*won't* you, Fenwick?"

There was an urgent emphasis in Trent's last words, and his eyes caught those of the surgeon's, and held them in a meaningful look. He couldn't say what he wanted to, but the message in his eyes was imparted to Fenwick, and the doctor suddenly nodded.

"Yes—yes, of course . . . But you'll have to remain quiet, Gaddon, and be patient a moment. . . ."

The creature stopped its advance upon Fenwick then. And a growl rumbled in Gaddon's animal throat.

Then Fred watched as the doctor stepped swiftly to a table with instruments and hurriedly began to prepare a hypodermic.

"I'll give you a special extract injection to start. . . ." Fenwick explained as he worked.

And Trent knew that the doctor was preparing an injection that would subdue the monster. That would enable them to call the police. . . .

And the eyes of Gaddon watched the fingers of the surgeon prepare the hypodermic. And for a single moment the human part of Gaddon's monster mind relaxed its tenacious hold.

THERE was a rumble of raging thought deep within his twisted brain. It swept up, gripped the human element, and enveloped it. A hoarse mewing sound left the twisted lips as the mind became a single, bestial thing.

And now it thought with a viciousness. It knew now that it was finally in control. That the full change had been completed. And it knew suddenly what it wanted.

Its animal eyes stared at the three humans. And it felt a hatred for the men who did not understand it. And it felt a desire for the woman who feared it. A desire that crept out of the primeval jungles. That swept through it to find one of its kind. And there was the vague instinct that was Gaddon, who told it how to fulfill that desire. Gaddon, who knew where the secret lay.

And then there was the driving urge that swept up from the animal ages. The urge to kill, to destroy what was hated. And the eyes of the monster fastened on the figure of Fenwick as the doctor turned from the table, the hypodermic in his hand.

"All right, Gaddon . . ."

The voice of Fenwick trailed off. And Fred Trent stared at the face of the monster. What he saw there brought a chill to his being. And he heard the girl gasp from the far corner of the room, as her eyes too saw the change that had spread over the face of the creature.

For there was no longer any vestige of human recognition in that face. There was no longer any trace of the man who had been Gaddon. There was only the monster now. The twisted, leering lips of an animal mind.

A harsh growl left those lips then and the creature moved forward toward the surgeon.

Trent knew what was happening, and he knew what he must do. There was death on that bestial face. Death that was reaching out . . .

He heard the dim baying of the Great Dane from the rear of the house as he leaped forward.

Then his fist lashed out and caught

the animal face in a lashing blow. His knuckles felt numb as he screamed:

"The hypodermic—doctor—quick!"

Then the creature turned on him and a long arm shot out. Trent felt a claw rake across his face and felt the burning bite of that claw sink into his flesh. Then, as he tried to dodge away from the beast and bring his fist up again, the monster leaped at him and Trent felt a powerful blow crash against his chin.

He spun back, falling to the floor, his head hitting the edge of an examining table. His senses reeled and he felt the blood running down his cheek, a warm, sticky stream that dripped to the floor.

He fought to keep his consciousness as he saw the beast turn away from him, satisfied that he was out of the way. Then he saw it leap at the stunned figure of Fenwick.

He heard the girl scream in terror and he saw Fenwick's arm come up with the hypodermic. He saw the doctor try to bring the needle down in a jab, but the monster's arm swept the needle aside and then a claw-like hand gripped Fenwick's throat.

There was a gasp of terror from Fenwick's lips as those fingers closed around his neck. Then the hypodermic fell from his nerveless hand and he fought to break away.

A deep rumbling growl spat from the lips of the monster as it closed with the struggling figure of Fenwick. Then the claws that were its hands raked the surgeon's throat in a feline rage.

Trent watched with numbed eyes, fighting back the wave of blackness that threatened to overcome him, and he saw the figure of Fenwick suddenly go limp in the grip of the monster.

He saw a spurt of blood burst from the man's torn throat, and then the creature dropped the limp body.

It fell to the floor, and a wave of red washed across the floor from the mangled throat. The monster stood over the lifeless body, a triumphant sound issuing from its twisted lips.

Then it turned toward the girl.

Trent tried to move. He tried to push back the weakness that numbed his body. But he couldn't. His head swam with the pain of the blow he had received, and he could only watch through half-closed eyes as the monster reached out for the girl.

Joan Drake screamed once as the long arms reached out for her. Then her voice ended abruptly as she fell to the floor in a faint.

The monster stood over her for a moment, then it reached down and picked up her body in its blood splattered arms.

It turned for a moment, holding the girl, and shot a hate-filled glance at Trent's limp figure.

Then it moved swiftly across the room and out into the hall.

And the baying of the Great Dane sounded angrily in Fred Trent's ears . . .

WITH a superhuman effort Fred Trent forced the numbness from his body and moved slowly to his feet. A horror gripped him that brought a new strength to his body, flooded it.

He stepped over the body of Fenwick, forcing his eyes away from the grisly sight of it as he dashed to the hallway.

"Joan—Joan!"

The girl's name came hoarsely from his lips as he ran into the hall and stared at the open door of the house. He ran to the door and out into the night.

His eyes stared wildly into the darkness, searching the street. But he saw nothing but his parked car at the curb. The monster had vanished. And with

him, the unconscious girl.

A hopeless despair welled up inside Trent at that moment. For he knew he could never hope to find the creature now. And by the time help came it would be too late. They would find Joan's mangled body . . .

The baying of the Great Dane rang in his ears then. The huge dog's howls of rage thundered in his ears and he heard the hound crash its great body against the closed door at the end of the hall, striving to get through.

And then a cry of hope left Trent's lips. He turned and ran back into the house. He grabbed the long leash from its wall hook beside the rear door and then he swung the door partway open.

"Brutus! Quiet, Brutus!"

The head of the Great Dane struggled through the partly opened door, a snarl of rage welling from the huge dog's mouth as Trent shouted at it.

Then he slipped the leash into its metal ring around the neck of the dog and pulled the door open.

The animal rushed into the hall, nearly tearing the leash from Fred Trent's hands as it lunged forward.

The dog paused beside the open door of the consultation room where the body of Fenwick lay dead and still on the floor. The animal lifted its muzzle and sniffed the air. A howl of anguished rage left it then and Trent knew that the dog sensed its master had been murdered. And then it caught the scent of the monster, the thing that had caused its wild rage to be unleashed, and it leaped forward, down the hall and out the front door into the night.

Trent held the leash tightly in his hands, running behind the straining dog, jumping over a low hedge after the animal as it headed down the shadowed street to the edge of the city.

And then the last house was behind

them and Trent was racing behind the dog out into the desert land beyond.

HIS breath was an aching fire in his throat. His legs were numbed beyond feeling. They were parts of his body that simply refused to stop moving, though every nerve and muscle in them screamed in protest.

It seemed like he had been running for hours, half tripping, stumbling across the darkened ground behind the seemingly tireless body of the Great Dane.

They ran in near silence now. Only the sounds of their labored breathing mingled with the night wind. The howls of rage no longer issued from the throat of the huge dog. There was only its panting breath, and the strain of its mighty body as it sought to tear loose from the man holding it.

But Trent held grimly to the leash, running as fast as his numbed body would go.

And he knew he could not go much further. That soon he would drop to the ground in exhaustion. That his last reserve of energy was nearly spent.

And then his eyes peered through the darkness ahead and he saw a glow of lights in the distance. And suddenly he knew those lights. And he became aware of where they were racing toward.

It was the Rocket Proving Grounds!

And the fence of the government project loomed close ahead.

And as they neared the fence, Trent's eyes pierced the darkness and he saw a jagged tear in the metal mesh of the fence. A tear that stood as high as a man, a hole through which a man could have entered.

The Great Dane bounded toward that hole and Trent followed the dog through it. He felt the animal pause momentarily and he nearly stumbled

over a body lying on the ground at his feet just inside the fence.

His heart stood still for a moment and the girl's name sped to his lips. But he never uttered the word. For he suddenly saw that it was the body of a guard. A body whose torn throat lay red and gory in death.

And then the Great Dane let a howl of anger out on the night wind, and the beast leaped forward again, Trent running behind it.

And ahead of them, Trent saw a great looming shape in the darkness, and as his eyes fell upon it, a despairing terror gripped him.

It was the second rocket! Standing in its cradle, silent in the night, a shaft of metal that looked skyward.

And a realization of what the monster had in mind struck him. He knew now where they were headed. He knew why the monster had torn the fence, why a guard had been killed where he stood.

And as if the thought had been a prelude, he saw the rocket loom before them as the Great Dane bounded around its base.

And he saw the metal stairway leading up to the middle of the giant projectile.

And at the top of those stairs, going into the now open rocket chamber, was the monster, holding the unconscious girl in its arms.

The Great Dane saw the creature in the same instant. And a terrible howl of rage welled from its throat. It gave a lunge forward then that broke Trent's grip from the leash he held. And the dog was free.

THE monster turned in the same moment and saw them. A roar of feline anger left its throat as the huge dog leaped up the steps toward the platform above.

The monster dropped the girl's body on the narrow platform and backed toward the opening of the rocket chamber.

Then the Great Dane reached the platform and poised itself for a leap.

Trent was dashing forward toward the stairs as the dog's body flew through the air. He saw the flashing jaws of the animal snap at the throat of the monster, as its heavy body smashed against it.

Then the arms of the creature were tearing at the dog as it was forced back into the rocket chamber.

Trent's feet flew up the stairs, his breath a tortured gasp in his throat. He saw the girl stir on the platform, as consciousness returned to her.

"Joan!"

Her name sped from his lips as he reached the top step. Then his hands closed around the girl's shoulders, lifting her to her feet.

The snarl of the Great Dane reached his ears from the rocket chamber, and the answering roar of rage from the monster as they fought. His eyes saw the vague, terrible shadows of them, heard the snapping jaws of the dog, and the raking claws.

And then he was dragging the girl down the steps.

They reached the ground and Trent pulled her away from the rocket, felt her come to life in his arms, heard the sob on her lips.

But his head turned away from her and he stared anxiously up at the open rocket chamber.

He heard the bodies of the monster and the dog slam against the inner side of the chamber, and then he saw the door of the rocket close. He knew that the automatic mechanism must have been touched in the battle.

And even as the thought ran through his mind he heard a sudden roar of

flaming sound. The night lit up in a sheet of brilliant light and a wave of flame spread out from the base of the rocket.

Trent pulled the girl away from that blinding sheet of exploding energy, and his eyes stared in grim fascination as they ran.

He saw the rocket shudder in its cradle and then lift slowly. It was as if time had turned back and he were watching an identical scene that had happened earlier that day.

Only it wasn't the same scene. It was now a scene of horror. For he knew that the monster and the dog were in that rocket. The rocket that would shoot skyward in moments, even as its companion had done. Would reach into the outer fringes of the Earth's atmosphere where the cosmic rays would envelop it, would react upon the animals inside it.

And a terrible dread spread through Trent at the thought. For if the first change had been terrible enough, what would happen now?

And as he thought, he saw the rocket lift slowly from its cradle and gather speed as it shot upward into the night.

THE blinding light of the exploding rocket fuel lit the proving grounds like a huge beacon of incandescence, and Trent was aware of shouts ahead of him, and running feet.

Then he was surrounded by men from the project, and he caught the glint of alert weapons and uniforms.

He felt arms grab him and the girl and heard questions pounding at him.

But then he saw a face he knew. And he tore away from the arms of the guards and shouted.

"Dr. Mathieson! Listen to me!"

The scientist stepped up to him and Trent gripped his arm in the fading

light of the vanishing rocket.

"What's happened here?" the scientist demanded. "Aren't you one of the newsmen—?"

Trent interrupted him. He poured out a string of words. Words that told what had happened. And as he talked he saw the eyes of the scientist widen in disbelief. And he heard the guards grow silent around him. Felt every ear listening with awe to his words.

And when he had finished there was a long moment of silence. And then Joan Drake moved tremblingly up beside Trent and she spoke:

"It's true, doctor! Every word Fred said is true!"

And one of the guards broke in:

"The word just came in from post four. The fence was torn to pieces—and Giddings has been murdered—just as they said!"

Then the silence again. And the face of Mathieson was grim as Trent broke through the quiet:

"—Doctor—that monster who was Gaddon—he's up there now! When the cosmic rays change him and the dog and the chamber is released . . ."

The scientist shook his head slowly, a look of awe in his eyes.

"It won't release, Trent," he said.

Fred Trent looked at him questioningly.

"Gaddon must have forgotten one thing," the scientist continued. "That rocket was also an experimental project. But not for the same purpose. It

was to test a new type of explosive . . ."

Mathieson's voice trailed off and silence closed over the small group then.

There was no need to say anything further. There was only the tension of waiting, the tension that showed in every eye.

And the girl moved closer to Trent, her body trembling against his.

They waited. The seconds passed like moments in eternity. Slowly they marched by, one by one. And then a minute. And the tension grew.

They heard it then. Off in the distance. Out in the waste of the open desert land. A thundering sound. An explosion that rolled in a wave of sound.

And with it a flash of brilliant light. Light that seared through the night in a terrible wave. And with it the thunder of the explosive warhead.

And then silence.

After a long moment the voice of Mathieson came through the quiet night wind.

". . . It's over. Gaddon is—dead. Poor fool, he fumbled with the tools of creation, tools that man is not ready to wield . . ."

And Trent heard one of the soldiers gasp, "What a story! *What* a story!"

But he knew, as he held the girl against him, felt her body relax beside his, that it was a story he didn't want to write.

He wanted only to forget . . .

GOLDEN CHARIOT



By A. MORRIS



THE warrior chieftains of old who rode into battle in their golden chariots have nothing on Nubar Gulbenkian, a wealthy middle eastern oil magnate. He is currently riding through the streets of London in his own private golden chariot. It is really a gold Rolls-Royce designed to his specifications. It is so stream-lined that

there isn't a projection anywhere. The doorhandles are set in and the wheels are hidden. Inside the beautiful upholstery is laid out in sumptuous curves. There is not a corner in sight. This golden chariot will do ninety miles an hour with ease. It took a year to build it and cost Gulbenkian only a mere forty thousand dollars.



The doctor did a very strange thing: he pulled out a gun and shot himself through the head.

UNTHINKABLE

By **ROG PHILLIPS**

If Nature suddenly began to behave differently, what we consider obvious and elementary today might become—unthinkable

DR. NALE HARGRAVE tossed his spotless grey hat expertly across the six feet of space between him and the coat tree, humming

the while a currently popular tune whose only words he could remember were "Feemo fimo fujo, the flummy fwam to fwojo."

His eyes rested self-congratulatingly on the hat after it came to a safe stop, then turned to beam an instant at his receptionist before he continued on to his office.

She smiled after him with an affectionate, indulgent look, gave him as long as it took her to powder her nose and tuck a few stray hairs into place, then pressed the buzzer that signaled to quarantine that the doctor was ready to screen the crew of the U triple S *Endore*.

The *Endore* had arrived during the night. Usually crews that had to wait hours before passing through psych raised a big fuss. Quarantine wasn't exactly designed for comfort. A man couldn't be expected to enjoy sitting on a bench and reading a worn-out magazine after looking forward to visiting his old haunts on Earth after months or years in space. His only thought

was to get through the red tape and step through the door on the other side of which lay freedom of expression and freedom from space discipline—and girls.

That was the usual result of forced delay in quarantine. The crew of the *Endore* hadn't let a peep out of them.

Martha Ryan, the receptionist, glanced knowingly at the closed door. She knew that Nale was sitting at his desk, his legs crossed carelessly, his long fingers holding the report on the *Endore* and the report of the psych observer. He was probably frowning slightly over the unusual behavior of the crew.

She had her own list of names of the crew on the desk before her. Heading the list was the name, Comdr. Hugh Dunnam. Dr. Nale would ordinarily call him first. Next would come any of the crew that the commander reported

IN THE story THE DESPOILERS in the October 1947 *Amazing Stories* I raised the question, "Is there anything absolutely beyond human comprehension?" In that story I gave humanity a thousand years to give birth to one man who could comprehend the incomprehensible.

The incomprehensible is harder to portray in a story than is merely the unknown. If we denote anything incomprehensible by the symbol X, we can describe what X is to a certain extent by knowing what it is not. We can, gradually, gain a certain insight into what it is by comparing it to what IS comprehensible.

In the last analysis the universe of normalcy is incomprehensible. We have made progress in comprehending it because we have isolated it into small bundles of events that can be dealt with by the human intellect.

We have arrived at certain basic pictures of the behavior of the incomprehensible. We have found a certain stability existing in the picture we have built up. We have searched the heavens and found that stars are made up of the same elements as the Earth—with a few exceptions. And with those exceptions we have brought them into the framework of our picture of the Universe by postulating "dense matter."

We have, slowly, come to the belief that the same laws operate throughout the entire Universe, just as they do here on the Earth. This is the Uniformity Postulate.

In that story THE DESPOILERS the Uniformity Postulate was not denied. The incomprehensible in that story was the mind of a Despoiler. It, to the human mind, was incomprehensible; and to the Despoiler, the human mind was incomprehensible.

Each viewed the Universe differently due to a difference in whatever lies at the foundations of the thinking processes. In other words, uniformity of the principle of thought was denied there.

Both the Despoilers and Man had mechanical civilization and science, but due to their different minds neither could comprehend completely the viewpoint of the other ON THE SAME THING. Each had applied his REASON to the disorder of nature and constructed what to him was a REASONABLE PICTURE.

The type of mentality I attributed to the Despoiler may be impossible. It may be that if the human race eventually reaches out and encounters other intelligent races it will find that the basic principles which result in thought as we know it are the ONLY basic principles that can give rise to thinking intelligence, so that wherever we find civilization we will find creatures that think the same as we do, and have seen the same pattern in nature that we have.

There is another possibility besides the encountering of incomprehensible minds. That is the possibility of encountering incomprehensible "islands" of reality.

unbalanced, followed by the rest of the crew.

Sometimes when the psych observer's report was unfavorable to the whole crew he called some crew member at random before calling the top name.

It didn't surprise her, therefore, when the intercom came to life and Dr. Nale's voice pleasantly asked for a name two-thirds of the way down on the list of forty names—Ren Gravenard, spaceman/2d cls.

Martha's pencil followed the list down, making a light check after the name while she dialed quarantine to send in the man.

In her mind's eye she could visualize the lifted eyebrows of the day shift guards as they glanced over the huddled crew. She could see their suddenly changed attitude toward the crew, their new caution as they opened the heavy wire door and led the man out. She

could see, too, the worried frown of Comdr. Dunnam, whoever he was, as he realized what that meant—to have a crew member precede him.

She could see, too, Dunnam's probable warning look to spaceman Gravenard to keep mum and play his cards close.

That was the trouble with crews of ships when they thought they might be held up by psych over something. They invariably overplayed their innocence right from the start.

The side door from quarantine opened. Two guards entered, preceding and following the first victim warily. Martha sized Ren Gravenard up closely while her face assumed the careful, welcoming smile that often brought attempts at dating.

Ren Gravenard was no different in appearance than a million like him. He was average in everything including

One thing we have discovered about nature that makes such "islands" possible—or that makes it possible WE are living in such an "island"—is that matter has a habit of "reacting" to some types of energy patterns, and "totally ignoring" others.

Perhaps you can better understand what I mean by the following analogous position: Kah is an intelligent entity fixed at a certain point. He can only derive a picture of reality from what he sees. He can only see a foot in front of him. In all his existence he has seen only one type of thing—rocks about an inch in diameter. He therefore concludes that all reality is rocks an inch in diameter.

He is unable ever to learn that he is situated at a place where the one-inch rocks leave a screen with seven-eighths-inch holes that let every smaller pebble and all the sand through, and that seven-eighths-inch screen is the catch-all for a higher screen with one-inch holes that kept everything larger from coming through.

His Universe is brought to him by selective screening. He rationalizes what his Universe presents him, and postulates that ALL reality is identical to what he can experience. He can NOT conceive of what is utterly beyond his range of experience and imagination—which is merely the re-arrangement of reality or of thoughts derived from reality.

We are perhaps in much that same position.

To be sure, our telescopes bring us data from stars that are so far away the human race will never reach them—but is not our telescope a "screen" that brings us only the one-inch rocks?

There may be and probably is a vast realm of reality co-existent with the reality we know, right around us; but it is "screened" from us. It may be possible that we know less than ten percent of actual reality around us due to the screening of our senses and our instruments that blocks completely, or permits to pass completely, every energy pattern that can't pass through the "holes" of our "screen."

Going back to Kah, the one-inch-rock-universe observer, suppose that in one batch of dirt dumped at the head of the screening system there happened to be no one-inch rocks at all? Or, more closely to the story you are about to read, suppose, with his mind deeply grooved with the tracks of the one-inch rocks, he were to move to a vantage point where there were no one-inch rocks, but larger or smaller ones?

He would immediately find nature behaving according to an utterly strange pattern, BUT he could only sort the incoming sensations according to the neural grooves already built up in his mind! In his mind he could only see one-inch rocks or nothing, and since what he would see would obviously be something, it would either seem nothing to him, or one-inch rocks behaving strangely.

His instruments and his mind would interpret

his type of character.

"You are Ren Gravenard?" she asked.

He nodded without speaking.

Martha pressed the button that told Doctor Nale the first one had arrived, got his O.K. signal, and motioned Gravenard and the guards toward the inner door with a sweep of long yellow pencil in perfectly manicured fingers.

As the three passed into the private office she made a slow dash after the spaceman's name preparatory to writing his destination when he came out. It would be "obs" or "O.K."

Then she glanced at her wrist watch. Its hands pointed to six after nine. Two hours and fifty-four minutes later Ren Gravenard had still not come out. And in her two years as receptionist for Dr. Nale Hargrave, Martha Ryan had never known him to spend more than twenty minutes with any subject . . .

Her manicured nail pressed the buzzer three times to signal she was going to lunch. Giving Dr. Nale a full minute to make any request, without receiving any, she opened the door to the corridor and left.

WHEN she returned an hour later she was surprised to see the door to Dr. Hargrave's inner office open and Dr. John Bemis, the chief of the psych staff, at the desk.

"Come in Miss Ryan," Dr. Bemis said, accenting his invitation with a wave of his hand.

He waited until she had come in and closed the door behind her before continuing.

"There's something's happened," he said gravely. "I don't know just what, and maybe I don't exactly WANT to know."

Dr. Bemis spread his hands in an

by the old gradations and scales and concepts. His Universe would still be made of nothing but one-inch rocks, to him, but its behavior would be strange.

Perhaps slowly, like a newborn child making sense out of its surroundings, or a foreigner slowly making sense out of our language, he would penetrate to the new reality with his mind. Perhaps in the very process his being would change its structure.

In the end he would be in a unique position. He would have the memories of one Reality, and the experiences of a new one. He would have the language of the old with which to describe the new to his old companions. Could he do it so they would comprehend it?

It would do him no good simply to invent new words to describe something beyond the experience of his old companions. He would have to describe something beyond their experience with words and sentences they had created to describe only what they had gained from their own experience! How could he hope to make them gain a true understanding of it?

He might tell them simply and truthfully everything he experienced—and it might come out utter nonsense! It probably would. Unless he could bring back some of the evidence, either intentionally or unwittingly.

At first that evidence might present a pattern of utter nonsense and contradiction with known

thought patterns and concepts. It might present seemingly normal events in nonsense sequences. It might present impossible events in seemingly normal sequences. It might even present disjointed events in sequence.

What it would present would be only what the screen of the senses and the screen of the mind could accept. Underneath would be a perfectly orderly pattern of events of some sort, behaving according to different natural laws in conflict with those we have existed under. Slowly we might penetrate to an understanding of them, but not at first, because at first they would be completely UNTHINKABLE.

In this story, UNTHINKABLE, an attempt has been made to depict such a conflict of nature and human mentality. It is not the ordinary science fiction attempt. It is not new laws working in harmony with old, or new discoveries that fit into the old pattern. It is, if you please, an utterly alien bit of reality in conflict with the old.

The story cannot but be inadequate. It is the froth and foam of the struggle. It is the parts that fit into the words and phrases and sentences. You won't like it at all—unless you have the type of mind that can reach a little way beyond experience. And though what you may "see" may have no counterpart in all reality, if this story serves to expand your mental horizons, it has at least found an excuse for being written.

—ROG PHILLIPS

all inclusive gesture.

"The universe is a big place," he said. "I suppose we should have expected that sooner or later we'd run into something a little outside normal experience."

He shook his head slowly, looking up at the ceiling as though trying to pierce it and see beyond. When he continued, his voice was sharp and businesslike.

"Tell me exactly what you saw, thought, and felt this morning. Every detail, however unimportant you might think it."

"There's really very little to tell," Martha said, surprised and alarmed. "There was this crew of the *Endore* in quarantine when I came to work this morning. They were unusual in that they didn't complain about having to wait, indicating a guilt feeling in the crew. Dr. Hargrave asked to see a common spaceman first. That proved he recognized this. The name of the spaceman he saw is Ren Gravenard, who was brought in at a little after nine and was still in there when I left at twelve."

She looked keenly at Dr. Bemis. Something was so radically wrong somewhere that she didn't have the courage to even ask him. She just waited.

"Dr. Hargrave has been taken to observation," he said without warning. "So has the crew of the *Endore*. I—ah—believe you may take an indefinite leave from the office until further notice. With full pay, of course."

"Dr. Hargrave?" Martha asked, not hearing the last.

"Yes!" Dr. Bemis's voice changed from harsh tenseness to contriteness. "I'm sorry Miss Ryan, but I feel it inadvisable to discuss it just now. All I can say is that full quarantine measures are now in force as of fifteen minutes ago. There will be no landing or taking off from Earth until it is lifted; and within this area the same quaran-

tine applies."*

Martha Ryan hesitated, then turned and left. Dr. Bemis watched her go. After the door closed behind her he did a very peculiar thing. He took a gun out of his coat pocket and shot himself through the head. After that he went to a mirror on the wall, dressed the wounds carefully, wincing at the bite of the alcohol in the raw flesh, and, after drinking several glasses of water, returned to Dr. Hargrave's desk.

HE SAT there, drumming his fingers on the walnut surface, his eyes closed as if he were listening to something very far away. A buzzer under his desk gave three short buzzes. He reached over and deflected the toggle on the intercom.

"Back already, Martha?" he said cheerily. "Any more left on your list for the *Endore*?"

Martha checked her list. There had been two left when she went to lunch. They had been checked off, too, while she was gone.

"That's all, Dr. Nale," she said.

"Good," came his voice through the intercom. "Think I'll go out and have something to eat myself."

* In 2027 A.D., just seventy-five years after the first space flight, a dangerous disease was brought to Earth which wiped out almost a million lives before a cure was found. Immediately an elaborate quarantine procedure was developed to take care of any possible eventuality. This also included the psych screening routine to check on the sanity and normalcy of returning space crews.

One feature of emergency quarantine was the creation of the spaceport zone, an area with a radius of fifty miles about the spaceport, which during quarantine was to be blocked off with nothing permitted to go either in or out.

For all-out quarantine as in this present case, a temporary planet quarantine was to be imposed, preventing the landing or taking off of any space ship at all.

Other measures would take effect if and when they became necessary, such as national quarantine, continent quarantine, and even harsh measures if they became necessary.—Ed.

The click of the intercom was followed at once by the opening of the inner office door. Martha's eyes watched Dr. Nale Hargrave as he walked through the office and out into the corridor.

Her eyes remained on the exit after he had gone, a faint frown creasing the smooth skin above her eyes. She had an IRRATIONAL impression that she had seen Dr. Bemis, the super, instead of Dr. Nale, and with his head bandaged clumsily.

She dismissed this with a pout and took a book out of a drawer to do her afternoon reading.

The buzzer on her desk buzzed a warning. She laid the book flat as the inner office door opened and Dr. Nale escorted Ren Gravenard out into the waiting room.

Martha glanced at her watch. It was ten after nine. Four minutes! She expected the nod from Dr. Nale. Her pencil wrote an O.K. after the dash she had drawn four minutes ago.

"Thank you doctor," Ren Gravenard was saying heartily. The two guards left by the side door back to quarantine.

Dr. Nale went over and bent close to Martha's ear.

"As your psychiatrist," he said pseudo-seriously, "I can advise you that unless you kiss me I am going to feel quite frustrated."

"Oh, that would never do!" Martha laughed, and kissed him.

She jerked back, startled. There was the sound of a shot from the inner office. The door was still open. Martha and Dr. Nale looked through the door, horrified.

Ren Gravenard was standing in the middle of the inner office dropping a flat automatic into his side pocket. There was an ugly wound on either side of his head from a bullet that had

passed directly through his brain.

He smiled at them disarmingly, "It's quite all right. You see, it couldn't possibly do me any harm because I'm waiting for the elevator."

"Oh," they said, relieved. They bent and kissed each other again while Ren Gravenard went over to the mirror on the wall and dressed the wounds, wincing from the raw touch of the alcohol on wounded bone and flesh.

The outer door opened and two men came in with a wicker basket.

Dr. Nale pointed over in the corner where one of the guards lay dead.

"What happened to him, Doc?" one of the men asked.

"He got shot through the head," Dr. Hargrave explained. "One of the men off the *Endore* did it. They're all being taken over to observation. I think I'll have to go over with them. I'm beginning to get an inkling of what's going on, and I'm very much afraid of what I think it is."

The two men set the basket down and lifted the wicker lid. Dr. Bemis came out of the inner office and laid down in the corner. The two men waited until he had settled himself, then lifted him into the basket.

Dr. Hargrave held open the outer door for them. He returned to the desk beside Martha and took a gun out of his coat pocket. He pointed it at her, frowned in indecision, then slowly, with perspiration standing out on his forehead, pulled out the clip and emptied the barrel of the gun.

"Good for you," Martha said. She picked up her book and started reading. Dr. Hargrave put the gun back in his pocket and went to the door.

"Take a few days off starting tomorrow," he said before going out. "I'm going to be slowly going crazy trying to figure this mess out. That's why I insisted to Dr. Bemis that I be confined

with the crew of the *Endore*—just in case.”

His heels made loud noises on the marble floor of the corridor. He pushed through the revolving doors to the sidewalk.

There was an argument going on between a small newsboy and an elderly gentlemen type of man.

“I tell you there’s only two pennies,” the boy insisted.

“There’s four,” the man insisted just as strongly. “See?”

He pried open the boy’s fingers and looked.

“Sorry,” he said. “You’re right.” His hand went into his pocket to make up the deficit.

“Hey! Wait a minute,” the boy said. “I was busy. You gave me two pennies too much.”

A small pudgy finger took two of the pennies. The boy glanced at the others to make sure the right number were left.

Nale was close enough to see what happened. He saw the pennies taken from what seemed to be seven or eight in the boy’s palm. When the two were taken away there seemed to be a slight blur—and there was only a solitary penny left.

He didn’t wait. The paper boy and the customer were still patiently arguing as he climbed into his car and drove away. He drove slowly with his foot close to the brakes.

Although his eyes were warily watching each car on the street, his mind was busy. *He was trying to figure out who had been shot.*

“It might even have been me!” he thought. And there was no way of knowing.

He drove the car another block. There was doubt growing in his mind. On a sudden impulse he pulled the car over to the curb and stopped the motor.

Getting out, he started walking rapidly. There would be three miles of walking before he reached observation, but it would be safer to walk.

A block further he stopped abruptly in surprise. The spaceport observation hospital was just in front of him.

“I should have guessed,” he muttered as he pushed through the heavy doors. “The speedometer, of course. Naturally it would go first.”

MARTHA RYAN saw the door close on Dr. Hargrave, then started reading again. She finished the page and turned it over. The first few words of the opposite side of the sheet showed the continuity to be difficult.

Thinking she might have turned two sheets by mistake, she turned back one. It was still wrong. She sighed exasperatedly. She distinctly remembered that she had been on page twenty-five, so the next page should be twenty-six. Since it hadn’t been, she would have to look for twenty-six.

She looked through the book, page by page, and it wasn’t there. Getting over her exasperation she made a game of it. Finally she developed to the stage where she would open the book at random, note the number of the page, close the book, and then try to find that page she had just seen.

It was a very peculiar book. She found that, (a) she could find any page number she wasn’t looking for, and (b) any page number she looked for was not in the book, even though it had been a moment before.

Resting thoughtfully for several minutes on this achievement of deduction she decided to try another experiment. She counted the number of sheets of paper in the book and wrote the number down. It was one hundred twenty-four.

Then she counted them again. There

were one hundred eighty-six. She counted them five more times, making seven times she had counted them. She got nine different numbers of sheets in the book. She decided she couldn't get nine different numbers after counting only seven times, and counted the numbers. There were five. She closed her eyes and counted to ten rapidly, then counted them again. There were fourteen.

She held out her hands. She had seven fingers on her right hand and three on her left. She chuckled dryly and thought, "Well, anyway there are ten altogether." She counted them to be sure, and there were thirteen.

Pursing her lips stubbornly she held up two fingers and counted them. There were two. She held them rigid and closed her eyes, counting rapidly to ten. Opening her eyes she looked cautiously at the upraised fingers. There were two.

She raised a third finger to join the other two, and there were five upraised fingers. Not only that, there were seven of them clenched. She closed her eyes and counted to ten quickly, then opened them. There were three upraised fingers. She counted the clenched ones and there were two. Relieved, she checked on the upraised fingers again—and there were seven.

She gave up in disgust. Deciding she ought to go home she stood up and started to cross to the coat tree.

The door to the corridor opened and Ren Gravenard stepped in.

"Hello!" Martha said in surprise. "I thought you were sent to observation."

"I was," Ren said. "That's where I am now, but when there are forty of you, you can sort of get lost in the group and wind up anywhere you want to."

"Well, I'm glad you're here," Martha

said dryly. "Maybe you can explain a few things."

Ren grinned crookedly.

"Suppose I do the explaining over something to eat," he said. "I almost stopped and had something on the way over here, but I wanted to wait and eat with you. Do you mind?"

"Of course not," Martha frowned. She was taking a closer look at this spaceman second class. He had a nice way of smiling at her. His eyes had depths she hadn't noticed before.

THE illogical thought came to her that maybe now that things didn't behave the way they should, maybe he and his fellow spacemen were the only ones that knew what it was all about.

"All this," Martha waved her hand vaguely. "It must have been caused by something about the *Endore*, mustn't it?"

Ren nodded, holding the door open for her. They walked along the corridor to the revolving doors, his hand tucked protectively under her arm.

"Is it mental?" Martha asked when they were on the sidewalk.

"No," Ren answered. "But let's wait until we eat. I'm starved to death. If you run into any trouble I'll help you out. You see, I know how to work things."

"Like finding page twenty-six in the book I'm reading?" Martha asked.

"That's simple," Ren said. "All you have to do is look for page twenty-nine and you'll run across page twenty-six right away. Things like that are mental, partly. I mean, you have to have the right attitude to get results you want."

"I don't understand," Martha said.

"Well, it's like this," Ren explained. "If you're looking for page twenty-six it won't be one of the first two pages you look at, regardless of where you

open the book. But after you've looked at three of them you've passed the page you want unless you're not looking for it. If you're not looking for it you REACH the right page."

"But why page twenty-nine to find twenty-six?" Martha persisted.

"It has to do with the new arithmetic," Ren said.

"Oh," Martha said dully. "So that's the whole trouble with everything."

"No, that's only part of it," Ren said. "But here's a good place to eat." He guided her through the door.

An hour later Ren lit a cigarette and took a long drag on it, his eyes looking longingly into Martha's. He exhaled the smoke in a long white plume. Then he began talking.

"I don't know whether you read it on the report sheet or not, but the trip of the *Endore* began from this same spaceport two years ago. The observatory on Pluto had reported a free planet passing within two hundred quadrillion miles of the solar system. The *Endore* was assigned the task of landing on it, if feasible.

"I had been a member of the crew for only four months when the *Endore* turned outward from its position just the other side of Mars' orbit."

Ren smiled apologetically.

"I hadn't exactly planned on being a spaceman, second class. I don't know whether you know the system, but whether you do or not, it should suffice to say that I had studied for five years to become a research scientist, and failed. I decided to take out my disappointment by joining up for two years. I planned on making another try at research when I got out.

"Everything went along fine on the trip out. We were a very congenial crew with a fine, human commander. He made it a point to get personally acquainted with every member of the

crew eventually. He seemed to take a particular liking to me for some reason. By the time we were half-way out to Metapor, as we found out it was called later, I was an unofficial first mate or something with free run of the pilot room and the instruments.

"I had guessed by now that when I enlisted they looked up my record and passed the word along to Commander Dunnam to sell me on the idea of a career as a spaceman.

"At any rate, I was in an ideal position to see all that went on first hand. We were within three hundred thousand miles of Metapor when we got the first indication of the change in metaphysics. I discovered it myself. I was helping the astrogator get the constants for the planet . . ."

"TAKE a look at the gravity board, Ren," Ford Gratricks, the astrogator said. "What's she say?"

Ren looked at the fine black pointer on the gravity potentiometer. It pointed to a spot just two marks above the number ten on the dial.

"Ten and two tenths," Ren read.

"That can't be right," Ford frowned. "At this distance that would make this baby a super."

He came over and looked himself. While he was looking the pointer moved up to twenty and then down to six tenths.

"Must be out of order," Ford muttered. "Well, this'll give you experience with emergency equipment. Break out the manual gravity dish, Ren."

It was a fine coil spring in a glass tube. Other glass tubes fastened on, to make the length almost ten feet. At one end the spring with its weight would stretch out to the bottom. From there to a ten thousandth of a g the spring rose up to a point half-way.

Ren put it together speedily, placing

it in the wall clamps designed to hold it. The glass itself was graduated with the scale of gravity strength. The cylindrical weight at the free end of the spring had a line on it that would coincide with the proper reading.

In practice it vibrated up and down so that it had to be read by estimation of the half-way point of the up and down motion.

Ren and Ford watched the red weight with its black line. It moved slowly and uniformly from the bottom to the top of the scale, from a full g to ten thousandth of a g, and back down again.

Meanwhile the gravity potentiometer (gravy board) was changing its reading constantly and erratically.

Ford licked his lips nervously and said, "Don't know what the old man'll say about this, but it looks like all we can say is that the thing *has* gravity."

"Why not call him and let him see for himself?" Ren asked.

Ford looked out the viewport at the round object in the distance and shook his head.

"I've got a hunch he knows it already," he said slowly. "The ship is probably on a nonsense track and the automatic tracker is either trying to find out what the law of gravity is, or is exploring for clues to light aberration. One gets you ten he'll give me a buzz in another minute."

He was right. The phone rang almost at once. It was Hugh Dunnam himself, asking for the gravity reading.

"You'll have to see it to believe it," Ford Gratrack said over the phone. "The manual swing is uniform over the whole range. The gravy board can't make up its mind where to settle at. It tries this and that reading."

He listened briefly. "Yes, sir," he said, and hung up. "He wants you in the pilot room, Ren," he added.

Ren started out of the central instru-

ment room through the axis tube.

"Better be careful," Ford shouted after him. "No telling how this gravitation will behave. Don't let it slam you against anything."

Ren heard his words. He had a sudden, crazy thought that it was his own voice, and that he, as he sped along through the ship, was in reality Ford Gratrack. The thought startled him. He promptly forgot it.

There was a frown of concentration on his face. He was trying to visualize a gravity pull whose intensity was not a single-valued pressure but a uniform continuum of pressure values from a minimum to a maximum.

It was like—well, like having an air pressure in a car tire that wasn't thirty pounds or thirty-two pounds, but every value from zero to thirty-five pounds.

It was like transforming the points and intervals on a line to a domain where there had previously been only points!

HUGH DUNNAM was waiting for him when he arrived in the pilot room. His iron grey hair was mussed from exasperated hairpulling. He jabbed a finger in the direction of the automatic pilot without speaking.

Ren saw that it had been cut out. The first mate was controlling the ship manually. The robot mechanism was still turning out its data sheets, however. In five minutes Ren saw that the only consistent detail was the distance of the ship from the planet.

Commander Dunnam watched him silently for several minutes. Finally Ren laid down the data sheets and looked at him with a slow smile.

"Well?" Dunnam asked.

"It reminds me of a kid I knew quite well when I was in grade school," Ren said. "He was an incurable liar, so you could never take anything he said, but

always had to figure out the truth yourself and act on it regardless of what he might claim to be the truth."

"You mean the instruments have all become liars?" Hugh Dunnam asked, amazed at the idea.

"No," Ren replied. "I don't think that. I think nature is the liar, in a way. I mean she is according to our standards. We'll have to outguess her, that's all."

"Now you're cooking," Hugh exclaimed. "What would you suggest?"

"We know this planet has gravity," Ren replied. "There's no way of knowing how much or how little. Suppose we kill our tangential speed and just fall in? The gravity will take care of that, regardless of its value or set of values."

"But we'll crash!" Hugh objected.

Ren took one of the report sheets and figured rapidly on its back.

"Unless I'm radically wrong," he said, "our speed of impact will be every speed from zero to a thousand miles a minute. Not only that, no matter how we try to land that will be the set of values for our speed. Naturally the thousand miles a minute will smash us flat, but the zero speed will let us down easy."

"And so?" Hugh asked suspiciously.

"No matter how we go in," Ren smiled, "we'll smash the ship and kill everybody—and we'll land safely."

"Are you crazy?" Hugh snorted.

"I—I'm not quite sure," Ren said seriously. "I think that we've run across a bit of matter that works from different basics than what we are used to. You might call it a different metaphysics. That's what it really amounts to."

A pain of remembrance appeared on his face.

"That's why I didn't get my degree," he said softly. "I insisted that it might be possible there were no absolute rules

underlying all reality, but only relative rules that might be changeable. In other words, I questioned the validity of asserting that natural law was universal. They flunked me in stability."

"Yes, I know," Commander Dunnam said sympathetically. "One of the most unjust rules of modern education in the opinion of many, but no way of changing it unless the educators themselves did it. Since they all passed O.K. in stability, they think everyone else should. Maybe they're afraid they would be considered unstable if they wanted to make such a major change."

REN glanced toward the screen that showed the magnified image of the interstellar wanderer, and back again to the commander.

"Of course," he said, "I'm trying to use ordinary basics transposed onto the basics of this system, which is wrong. Or it may be right. It might be better if we just turned around and went back. There's no way of knowing ahead of time whether we'd be killed on landing or not."

"Look, Ren," the commander said seriously. "I like you. You—you're just about like my son would have been today if he had lived. I'm just a spaceman. I depend on instruments. They don't work here. All of us are just as helpless as if we didn't know the first thing about our trade. We can't go back without landing on this stray planet. If we tried to tell them the reasons, I'd be retired and the whole crew would be stuck on various routine tub runs. Suppose you unofficially take charge. If we get killed—we all expect to end that way in our trade. If we don't, we'll be able to take back something with us to prove what we've run into. Maybe it will vindicate you and make you a reputation. You'll get all the credit I can turn your way."

"Thank you, sir," Ren said, his voice choked with gratitude. In his heart he knew that he would have sold his soul to the devil for this coming experience that had been given him without his asking.

He had spent years preparing for this—years that his teachers had felt were wasted. He had explored all the crazy systems of logic abandoned in the march of progress. He had even devised systems of his own, synthesized from undefined symbols according to strange patterns outside the field of logic.

Yes. He felt that even if the basics of natural law in operation here were purely nonsense laws, he would be able to penetrate to a rational manipulation and control of things. Perhaps he might even set up the pattern operating, and join it in some way with so-called normal science.

Commander Dunnam came to attention, a twinkle in his eyes.

"At your command, sir," he said, saluting.

"Not that," Ren objected. "Let me just play the part of a scientist under your command, whose part it is to advise only."

"No," Hugh Dunnam said. "Until we leave this part of space you're in sole command. Call it what you want—a hunch maybe; but I feel that there is a purpose in things, and it wasn't chance that gave you the type of mind you have and threw you under my command on this trip."

"Very well, sir," Ren said, returning the salute. He smiled. Behind his smile his analytical mind was working rapidly.

"The commander's reactions are not normal," his thoughts said. "They could not be dictated by anything in his past. Therefore they are dictated by something outside him—something on that planet below!"

It was a wild conjecture. The more he thought of it the more certain Ren became that there was some *intelligence* down there that had already made contact with the minds in the ship.

Strangely, this didn't alarm him. He felt that "it" was friendly. He felt that "it" had plumbed the minds of all on board and chosen him to take over and lead the others.

Eagerly he "listened," but no faintest whisper or flavor of thought came to support his feeling of an alien contact. In spite of this he went ahead with his study of things with a confidence that "something" was watching and would see them through all right.

HIS eyes turned again to the image of the cold planet below. That image returned his stare blankly, its inscrutable surface devoid of any hint of mystery.

"I'd suggest we keep circling the planet until I have a chance to form a few definite conclusions," Ren said. "If that can't be done I'd suggest we retreat far enough so we can."

"Yes sir," Commander Dunnam said quietly. He repeated the suggestion in the form of an order to the first mate.

Ren studied the image of the planet. He left the pilot room and wandered over the ship aimlessly. He talked to the members of the crew he ran into.

He slept at his usual time. He ate his meals as usual. He stopped talking to the crew and just wandered about, occasionally going to the pilot room and studying the strange sphere of matter.

After three days he ordered the ship dropped to an orbit about five thousand miles from the surface. Almost as soon as the ship reached its new orbit changes began to be noticed.

Ren had the commander issue an order that every crew member was to report all unusual happenings within the

ship. Twenty-four hours later he issued an order that each crew member was to write out a brief report of his movements during the past twenty-four hours as he remembered them.

Ren studied these reports. And gradually he was building up a picture that was wilder than the wildest of fantastic imaginative creation.

He and Commander Dunnam had grown very close to each other. Finally Ren broke his long silence and talked to him about what he was discovering. They were in the dining room. Crew members were eating their "evening" meal. They listened as Ren tried to explain.

"I think I've formed a few permanent conclusions about things here," Ren began. "They aren't an EXPLANATION of things, but just a description of the way things are behaving. I'll try to make it clear as I go along."

He chewed his food slowly while trying to think of a good way to begin.

"Take any number, for example," he said. "Take the number five. Back on Earth you can count five apples and say there are five apples. You can count out five eggs and place them in a box, and say there are the same number of eggs as there are apples. There are five of each. Actually that isn't true. There aren't five of either. There is no such thing as the number five. The number is a mental thing, a concept. The apples have a basic property which would more accurately be called a 'fiveness'. The eggs also have a basic property called a 'fiveness', and the fiveness of the eggs and the fiveness of the apples are NOT the same. They are peculiar to each group. The human race invented a concept called the number five, and formulated a theory that all fivenesses belong to a class, called the number five. In nature this theory acted as though it were true. If you have five apples and

five eggs you have ten objects. A fiveness placed with another fiveness makes a ten-ness. So arithmetic merely describes the behavior of a basic property of reality in a consistent manner. Arithmetic is NOT a basic law. It's merely a DESCRIPTION of a basic law.

"That basic doesn't seem to hold where we are now. But there are other basic things that seem to be violated here, too, and will probably be violated even more when and if we land on this planet.

"I've pretty well concluded that number doesn't exist here in the same way it does ordinarily. Take the strength of gravity, for example. Instead of being a single value it is equally a broad range of values, and is all of them at the same time. How that can be I don't know.

"IT'S the same way with the number of objects. Instead of having five fingers I have three, four, five, six and so on, fingers all at the same time. But my mind can't see that. It can only grasp a single number. My eyes look at my fingers and see the many simultaneous numbers of fingers, but my mind can't grasp that, so it conjures up a single number at random. It RATIONALIZES what it gets, and so we have a real problem—the devising of some method of helping the mind deal with what it can't grasp because it hasn't the equipment to grasp it as it really is.

"There are sixty of us on board—or rather, there WERE sixty. Now there are three, four, and so on, to some number above sixty. The last report handed in by the crew shows eighty-three men on board! I can't prove it, because if I handed you the report sheets you would count more or less than that number.

"So what we must realize is that now

there isn't any NUMBER of crew members, but a 'something else' that is different than a number, corresponding to an INTERVAL of numbers. It is real. It's a metaphysical basic for this part of space around this planet.

"It's subtle, too. For example, right now there may be more than one me on this ship, depending on whether there are more than sixty people on board or not. I don't quite understand about that yet. There are a lot of things I don't understand about it. If there is more than one of any person on board, is it a reality, or is it a trick of rationalization of the mind to fit something utterly incomprehensible into at least a semblance of something comprehensible? If it is the latter, then why do the two who are supposedly the same person hand in DIFFERENT reports on what the supposedly one person did, and why do the reports check with other reports?

"I have a theory which might account for part of all this. Our ship and all in it belongs to the universe of the metaphysics we know of and use as the thought process. It is hovering on the borders of a region containing this planet we are to land on—a region operating on other basics. In some way both sets of basics operate in either conflict or compromise. Besides mental confusion there is actual physical confusion.

"But maybe it's better that way. If we make the transition in steps the actual neumenal confusion may guide our minds correctly into a correct understanding of the new basics of this system by the time we land."

Ford Gratrack had come into the dining room unnoticed at the beginning of this. He spoke now.

"Then you claim that the laws of nature are different here than we are accustomed to, and that our minds are

not equipped to deal with them?" he asked.

Ren frowned. Not at the words but at something he had not mentioned, about people and identities.

"They are different, yes," Ren returned. "But as to our minds dealing with them—human minds have dealt with things without truly comprehending them since the dawn of time."

"Things that were sane," Ford said.

"These are sane, too," Ren said, studying Ford keenly from hidden eyes. "They're just sane in a different way."

"So is a crazy man," Ford almost sneered openly. "I think we've seen enough to make it obvious we should get away from here while we can."

There was a murmur among the men at the tables that agreed with what Ford had said.

"We may do that," Ren said, ignoring the signs of almost open defiance patent in Ford's tone and manner, and in the men's muttered approval of what he had said. "But we won't until we're sure it's suicide to go down there and land. Don't you realize that we have something here which may be unique in the universe? This space wanderer won't be close enough to the solar system for exploration more than two or three years. Then it will be gone. There may never be another opportunity to study something like it."

"Which is a good thing," Ford snorted. "If you decide to drop the ship any closer to this mad planet you're going to have trouble with the men."

"Meaning you've been talking to them?" Commander Hugh Dunnam asked softly.

"Talking WITH them," Ford Gratrack said, matching Hugh's softness. "Don't try to put me in the position of being a leader of any rebellion that might develop. I'll confess quite frankly, though, that I want no part of land-

ing on this God-forsaken hunk of matter, and a good many of the crew agree on that. It's suicidal. Frankly, sir, I think you must be under some kind of spell to turn your command over to a spaceman second class as you did."

REN'S scalp crawled. This had been exactly what he himself had felt! So others besides him had "felt" that alien contact from below! On impulse he made up his mind.

"Before anyone says something they might regret later," he cut in, "let me say that I've made up my mind that it's too dangerous to land. The effects we experience up here would probably be increased beyond conception down there. Our thought processes are being affected in ways we can't understand. It's possible that if we landed the ship would behave so differently that it would be impossible to get away. So, give me another two days of study in this orbit and then we'll go back to the solar system."

While Ren was talking he had a curious feeling, far back in the depths of his mind. It was as though a section of the bank of a stream had broken off and dropped into the stream.

Irrational. There had been so many such feelings that crept to the borders of consciousness and faded away without meaning anything.

Time! Ren felt that time was all he needed to get to the bottom of it. He compared himself to a newborn babe coming into the world. For the first few months things come and go in meaningless fashion. Slowly the mind makes order out of them. The oft-repeated patterns become clear first, then more obscure ones. Finally the baby is able to understand the apparently senseless sequence of events.

Ren felt that the results would be the same here if he were given half a chance

. . . but Ford Grattrick was right, too. It concerned more than the mind. It struck at the roots of reality that had been used in the principle of the ship's operation—and there was no way of knowing the ship would operate once it landed.

REN GRAVENARD flicked the ashes from the end of his cigarette off the edge of the table onto the floor. Martha's eyes took this in and slowly lost their faraway look.

"I'm trying to make clear, Martha," Ren said gravely, "the emergence into consciousness of the things going on around us. There was no way yet for us to suspect their full activity—their inroads. Things were going on that we simply could not see or sense in any way because we didn't yet have the faculty of grasping them. They made their impression and were lost in a hodge-podge of neural channels already deeply grooved in the normal way, so that when they got close enough to the conscious mind to be sensed, they were distorted beyond any semblance of the true reality."

"I can see that," Martha said, her eyes brooding. "But DID you find a living, intelligent creature or race on Metapor?"

Ren nodded. "I'm coming to that later," he said. "Be patient and let me take things in order. That's the only way you can understand when I tell you about—her."

His eyes studied the glowing coal at the end of the cigarette. He lifted the white cylinder to his lips and sucked in. Dropping the cigarette on the floor and stepping on it, he let the grey smoke seep from his mouth and nostrils.

Traffic sounds came through the window. A murmur of voices drifted over the two as they sat there, quietly.

"I've tried to bring you up to the

point where I began to suspect," Ren continued. "I described the feeling I had that was something like watching a large chunk of the bank of a stream break away, starting first as a jagged crack in the turf, with it widening slowly at first, then faster, until the broken chunk becomes a separate THING, dissociated from the bank. It breaks away, drops into the stream—and vanishes; while the bank itself remains, enclosing and containing the rushing stream.

"I didn't realize then what that feeling meant. I had felt it in varied shades before. It rose almost into consciousness, then, like the broken section of the bank itself, it would drop away and dissolve in the swirling stream of mind.

"Sitting there at the table in the ship's dining room, suddenly I suspected what that feeling really sprung from. I got my first inkling of what intervalness instead of numberness really meant.

"For an insane period I was two people, both the same person and yet not a person—and even not two, or even one, but a 'something' that *contained* in the logical sense all of those, as a class contains the members of the class.

"Remember that I said I was making a little speech, sitting there, that assured Ford Gratricks and the members of the crew present in the room that we weren't going to risk landing, but get away in a couple of days.

"At the same time, while I was talking, I was experiencing this strange feeling. It was quite clear, for a few seconds. I was two Ren Gravenards, saying two different things. The two of me were very close. But while I talked they separated distinctly as the bank of the stream and the chunk are suddenly not one, but two.

"It was not me alone. Every man in that room was doing the same. The ship itself was doing it—and sudden-

ly . . ."

"BEFORE anyone says something they might regret," Hugh Dunnam, the commander, said in a quiet warning voice, "get this straight, all of you. This is a government ship. I'm an officer of the Earth Space Fleet and my command is law. I have a right temporarily to promote any member of my crew to complete command of the ship with power equal to mine or even greater than mine. If Ren Gravenard says we go down, we go down even if it seems certain we'll all be killed. You have a choice of certain but honorable death, and equally certain but dishonorable death. Or you have a choice between an uncertain but honorable death if death it is, and certain but dishonorable death as a coward and a traitor. Let's not have any more thoughts of insubordination. You, Ford Gratricks, under a stricter commander, would already be on the way to the brig."

Ford looked at Hugh Dunnam through slitted eyes, his face expressionless. Suddenly he smiled.

"You forget, sir," he said smoothly. "Under a less human commander I would have kept my thoughts to myself."

"I WAS sitting there, Martha," Ren said. "Trying to grab hold of the strange 'split' in things. It's even more mixed up than I pictured it. I had a feeling of BEING both Hugh Dunnam and myself, and also of being myself on a 'something' drifting apart from all I could see. At the same time there was a feeling of two separate things now existing on the ship. Those two things might be called a composite of each of the two forces that began their existence at that moment—the forces obedient to the commander, and me; and the forces that were to side in with Ford

Gratrick."

"In a way numberness in any group depends on the independent unity of each member of the group. Put a thousand drops of water in a glass and you don't have a thousand drops of water but a teaspoon or so of water. It would be impossible to take a drop of water out and definitely say that it was one of the drops you had put in. And if you changed all the water back into drops you might have more or less than the thousand you put in.

"But water is a fluid. A human being is not. In some inexplicable way, however, I was becoming more and more like the drop of water after it is dropped into a large volume of water. I was 'spreading', while all the time seeming to be just my normal self.

"I think I was beginning dimly to see the new metaphysical basics that were to make the whole thing sensible and manipulable. At least, I had already realized that it was different than would be, for example, the difference in operational principle of a gas engine and an electric transformer.

"If you've ever studied any abstract mathematical system you'll be able to understand how the changing of one basic axiom can alter the whole structure almost beyond recognition. Suppose that change in a basic axiom were not a clean change, but that for a time both the axiom and its alternative were to be used interchangeably and unpredictably. You would have results that were double-valued. You would have contradictory results following from whatever you began with until the old axiom got weeded out entirely.

"Perhaps you can see that well enough to understand everything. I hope so, Martha. If you can I can skip the landing. We DID land. We crashed, and we landed safely. We also did something else. I think that when they

check the records they'll find that the *Endore* also came back to Earth and reported that it hadn't actually landed on Metapor. It did all those things—returned over a year ago, landed safely, and was crushed in landing. If you could see HOW it could do all those things—it's like the page in a book; you pass it if you look for it, and find it if you don't look for it.

"It's happening here on Earth right now and will keep on happening until the old basics that contradict the new ones are no longer operating. You see, Martha, we knew that would happen. That's why we came back. The new system is so much more perfect than the old. SHE taught it to us when we landed. Ford Gratrick and his fellow objectors were killed in the ship that crashed. They also were on the ship that came back to Earth. They're alive and they're dead."

Martha's face was a mask of confusion. She was trying to understand and not knowing how. Ren saw this and tried again.

"Suppose we try from this angle," he said patiently. "If a car is going ten miles an hour it will be ten miles farther on at the end of an hour. If it goes twenty miles an hour it will be twenty miles farther on. But suppose it goes both ten miles an hour and twenty miles an hour. At the end of an hour it will be ten miles and twenty miles along, and according to what the Earth is used to it would have to become two cars to do that.

"If it went every speed from zero to twenty miles an hour it would have to become an infinite number of cars, and occupy every position from the starting point to a twenty-mile distance at the end of an hour. That would be the conventional conclusion to the abstract problems. With the new basics it does just that—except that it is still

just one car, and yet never was just one car and never will be. It CAN'T be, because there is no such thing, in the new system, as a one thing.

"I myself am not Ren Gravenard, only Ren Gravenard, or anything else that your old ideas can conceive of. You'll see, Martha. The whole world will see soon, just as I did after we had been on Metapor a short while and had gotten the contradictions out of my mind and my structure."

"Then what are you?" Martha asked tensely.

"I'm the crew of the *Endore*," Ren said softly. "I'm Ren Gravenard here and now because that is the only thing you can accept at present. I'm—Her, the incomprehensible."

A question rose in Martha's mind. She drew back from the question as from the brink of the Abyss, yet felt drawn magnetically toward it. Ren watched and knew what that question would be. She opened her lips.

"Who—am I?" she asked.

"Look at your hands," Ren said.

Martha looked down at her hands resting on the edge of the table. They were large, gnarled, strong—the hands of a man. She flexed them. They were smooth and skillful.

Wonderingly she raised her eyes to look at her companion across the table. Her companion was—herself and she was Ren Gravenard. Anything else would have been—unthinkable.

THE END

THE AUTOMATIC SWITCH



By ARTHUR FABER



THINGS we don't often think about, things which are a small and humble part of our existence, often prove to be of the utmost importance in the long run. An example of such a thing is the little relay. The relay is not a new invention, yet each day more and more uses are found for it. It is the jack of all trades in the modern technological world of applied electricity.

What is a relay? It is a gadget so simple that it was among the very early electrical inventions. Its invention stemmed from the need for scientists and technicians to have some way of opening and closing switches at a distance. The answer to this problem, the relay, is a little mechanism made up of two parts, a solenoid and a switch.

The solenoid is simply a coil of many turns of wire surrounding an iron core, the purpose of the latter being to increase tremendously the magnetic field produced by a small electrical current passed through the coil. The switch usually takes the form of two or more contacts mounted on flexible springs, or lever arms. Sometimes the contacts are held open when the current is off, by springs, or they may be closed to reverse the operation. That in essence is all there is to a relay. But the employment of this simple thing is another story. In almost all branches of electro-technology, radio, electrical engineering, tool making and a host of other activities, relays are found by the hundreds. One of the best examples of

the use of the relay is the telephone exchange, particularly the automatic kind. Here relays are used by the thousands. Whenever a number is dialed, before the proper contacts are made as many as thousands of relays will have gone into operation.

Relays may be more complicated than the simple type described above, but nevertheless they work in the same manner and their complication is a matter of degree, not kind.

The automobile owner finds a relay or a number of them in his car. The voltage regulator of most automobiles consists of a set of three relays whose function is to control the charging rate of the battery, the consequent voltage, etc. Push button starters are an excellent example of the simplest type of relay. Pushing the button passes a small current through a solenoid which closes the contacts on a large switch between the starting motor and the battery. Thus a small current is used to control a large one, one of the most frequent uses of relays.

Automatic circuit breakers are variations of a relay. They automatically open themselves when the current through them exceeds a predetermined limit.

In the whole world of automaticity, which seems to be the future destiny of the United States, the relay will play its biggest role. It is an extension of Man's faculties.

The SUN KING

By GASTON DERREAU

The people of Par'si'ya forgot their God, and worshipped only murder, and sin. But then the virgin Too-che gave birth to a male child . . .



BEFORE the flood, even before Egypt's greatness, the world was divided into three main countries, named Jaffeth, Shem and Arabin'ya. There were other less populated lands and places; Uropa in the west, Heleste in the north, and the two great lands of the far west, called North and South Guatama.

Now, at the juncture of the borders of the three greatest countries, lay a mighty city, named Oas. It was the capital city of the Arabin'yan nation called Par'si'ya.

Its Temple of Skulls was the greatest known to any traveler, but the temples built to the god, Mazda, and his son, Ihua'Mazda, were empty and unadorned—the people had forgotten God.

So-qi, King of Oas, sent out his armies throughout Jaffeth (China), conquering and slaying, bringing back

ever more skulls for the Golgotha temples, more gold and more slaves for the enriching of King So-qi. His harem was the greatest of buildings of the mighty city, and his wives beyond man's ability to count.

TOO-CHE was one of the finest ornaments of the city of Oas. Too-che was slim, her breasts were two mounds of magic, her eyes were pools of mystic green depths, her legs were subtle, sinuous beauty.

But Too-che was a virgin, and in all that city of a million sinful souls, she alone held aloof from the sins of the flesh.



When the soldiers of the city Oas saw that their King had not the backbone to enforce his own decree when it hurt himself, they one and all took up stones, and they stoned King So-qi to death

Which was very strange, for Too-che became big with child, though she had not been with a man!

Which came to the ears of So-qi, upon his great black throne supported on a tower of human skulls, in his palace of Gran, across from the great Golgotha, which was built entirely of human skulls—the skulls of people conquered by the armies of Par'si'ya, over which the city of Oas reigned.

So-qi shook his big belly under the lion's skin, let slip his serpent skin headdress, and let the battle axe that was his symbol of office drop from his hand as he shook with mirth at the great and thumping lie told by Too-che.

"I suppose her child was fathered by Mazda, peering into her womb with his All-light," laughed So-qi, for in Oas it was not the fashion to worship the God Mazda anymore. The great skull temples had their priests and their sacrifices, but no more did people bow down in the temples of Mazda, or have anything but ridicule for those few who did still worship in the old way.

His serpent skin headdress and battle axe scepter, too, were relics from the past. Just as the belief in Mazda. But more *potent* relics, by far. With them he was the Sun King, Lord of Battles, Master of Life and Death, Creator of the Universe, Lord of Souls, Maker of the Law, etc. Without them he was just old So-qi, getting fatter and more stupid every day.

"Bring this harlot before me, to see if she can produce a miracle to prove her child is not a common one. If she cannot, she will be stoned to death at once, do you hear! I have no time to be bothered with the lies of every sinning woman who seeks to hide her bastard's origin."

ASHA, the philosopher who had told his king of the birth of the child,

nodded his head sadly and left the presence. Why did kings have to get so blown up as to be inhuman? He sympathized with the girl and her predicament. If it had been his to say, he would have had the child proclaimed divine a thousand times in preference to shedding one drop of her blood. But then, he had seen Too-che sauntering home from the well, with her water jar on her head, and her hips the focal point of all eyes in the street. Asha smiled, and took his grey-headed, bent, unnoticed figure down the back streets to the house of Too-che.

As he went, he pondered gloomily on the fate of this great city under the heartless and ignorant So-qi. Surely something dreadful would happen to Par'si'ya, lying as it did at the juncture of the lands of the three mightiest kingdoms of the world. Jaffeth (China), Shem (Africa) and Arabin'ya. Any one of them could crush them, did they get themselves organized for it. And So-qi preyed upon them all ruthlessly, knowing they could never stop warring interiorly long enough to attack him.

Old Asha thought of the future, which his star studies were supposed to give him power to foretell, and of the great flood that was to come and wipe out all the old boundaries and nations. He thought of the peculiar grey-blue sky, which the Wise men had taught him bore up within its whirling self vast oceans of water, waiting for the time to drop the whirling water-shell upon them all. He thought of Uropa, the great land in the west, and all her peoples. He thought of Heleste, that mighty and gracious land in the North, and all her beautiful and strong and courageous people. And he thought of the two great lands of the far west, called North and South Guatama. And he was sad, for they were all to die in the great deluge to come! But the time was not

yet come.

Sadly he pushed among the stalwart copper-colored men of Oas, gazing a little wistfully at the women's proud breasts and the strong young thews of their lovers beside them. If only he were young again . . . Asha sighed, and knocked upon the low, rude door of the house of Too-che.

THE smile of the beautiful Too-che made him welcome, very proud to have the wise man from the court inquire after her child.

"He worries me, wise Asha," said Too-che, moving slim and supple as a panther to sit protectively beside the little cradle of bent ash bows lashed together with strips of hide. "He talks like a man grown, and him not yet weaned!"

"Hmmm." Old Asha looked down upon the over-large infant solemnly looking back at him. He nearly fainted when the tiny red lips opened, and a strange, small voice, cultured and adult, said:

"I am not the child you see, but your God, Mazda, speaking through the child's lips!"

Asha pondered for only a moment, then turned in anger upon the woman, Too-che.

"I pitied you, harlot, because the King has ordered your death if you did not produce a miracle. But I did not think you would hide a man behind the child's cradle to befool me, old Asha! What do you take me for?"

Too-che broke into tears, bending her graceful neck and sobbing to hear that the king had decreed death for her. But the peculiar voice came again from the child's mouth.

"Take me in your arms, Asha."

Feeling very foolish, but unable to refuse for some mysterious reason, Asha bent and picked up the child.

"O man, temper thy judgment with patience and wisdom."

Asha knew now that it was the child's voice truly, and at last asked:

"Why do you come in such a weak and helpless guise, O Lord Mazda? I had hoped to see a God appear in stronger shape."

"Nevertheless, through this helpless child in your arms, this city shall be overthrown, yourself made King of Kings, and I shall deliver all the slaves and strike off all the bonds from the old time. Mazda will have this city for his own, or it will be destroyed forever."

Now Asha was filled with wonder, and asked the babe of many abstruse things, receiving answers beyond his understanding. So, at last convinced, he put the babe down, turned to Too-che.

"Listen, maiden who in my eyes is without fault. I cannot go to my King and tell him one word of what this child has revealed, for I would only die with both of you as a liar and worse. You must take this child and hide him away from the eyes and the ears of the men of this city. You in your innocence do not understand the ways of kings and courts and warriors and such things. Flee, for if you are here tomorrow, you will die and your child will die with you."

Asha took himself out, then, and made his way sadly along the crowded streets to his home. There he packed up a few belonging and left to go into hiding himself; for he knew better than to try to tell So-qi any such cock-and-bull story. Yet if he went at all to So-qi, he had to tell something, and either way someone would be doomed, if not himself.

Too-che took up the babe and fled through the city by night to the home of one Chojon, a maker of songs. This man had long made love to her with his

poetry and his voice from afar, and she knew he would hide her and protect her. Her heart was in her throat, because she wondered if he would believe in her virtue now that she had a child, or in her love for him when he felt that another had given her child when he had been denied the privilege.

SLENDER and dark eyed and handsome he stood in his doorway, looking upon this girl who had come to him with her babe in her arms. A babe by another! His heart was hurt, tears came unbidden to his eyes as he turned and allowed her to enter. For a long time he could not speak, the shame and the hurt and pride and the strange new sudden emotions in him not suffering him to talk. At last he said:

"Too-che, I love you and I cannot deny you anything. If you put this shame upon me, I will bear it as my own. Consider this your home, and me as your slave. If I did not love you, I would not bear this, but I do."

Too-che saw the conflicting emotions upon his face, how his dark red lips struggled to remain firm, how his thin, wide nostrils trembled, how his eyes were wet with unshed tears, how his shoulders bowed as with a sudden burden.

"Oh my dear Chojon, I have no other friend to whom I can turn—and that I thought of you, who has only loved me from afar with your eyes and your soft, sad songs, should tell you that I bring you no shame or insult. This is not the child of another man, for I have been with no man, ever. This is a child of the legends, a son of a God in the skies, our God, Mazda. He is a miracle, as hard for me to believe as for you, but it is true."

Too-che could not stand the unbelieving eyes of Chojon, who thought that Too-che lied, and looked down at

the sleeping babe in her arms, saying with a pitiful voice . . .

"Please, little stranger who talks like a wise man, wake and tell my Chojon that you are not the son of a man, but the son of one whom no maid could resist or run away from, ever. Tell him, little one!"

And Mazda heard Too-che imploring speech of her child and made it to speak with his own voice.

"Chojon, what my mother says is true. I am the child of the All-light, endowed with powers beyond ordinary men to accomplish my Lord's mysterious purposes here on earth. Do not hold my mother the less for my birth."

Chojon sank slowly to his knees, realization stealing over him as he heard the adult words issue from the suckling babe's mouth. The unshed tears began to pour from his eyes in relief, for he knew now that Too-che might not love him yet as she would when she learned love, but at least she had given herself to no other mortal man. And the miracle of the Child of a God there before him lighted up his face as his inward soul, so that he took up his lute and lifted his rich, deep voice in a joyous song—the Song of Zarathustra. For the legend of their people had the name of the babe-to-come as Zarathustra, and Chojon knew that its name was thus, now.

TOO-CHE dwelt for some time in the house of Chojon, and the songs of Chojon were circulated among all the singers of the city, so that everyone knew he sheltered the Child of the God, Mazda, in his home.

The songs of Chojon came at last to the King's ears, and as one of the songs proclaimed Zarathustra as stronger in one finger than all the power of So-qi, he let out a great oath and set his soldiers to find Too-che and the babe. But

Chojon heard of the search. He took Too-che and her babe out of the gates in the night and went off into the forest and joined a band of Listians, who are raisers of goats, and a fine, strong people.

Now when the search failed to find the babe, So-qi proclaimed that every male child of the City Oas would be slain if the child was not found. And within a week So-qi was sorry, because his own wife gave birth to a little son whose life was already forfeited by royal decree unless Too-che and her child were found. And they were not to be found in all Par'si'ya.

Asha, the old philosopher, who had been in hiding all this time, now came out of his hole and went to the King to give him counsel.

As Asha progressed through the city, mothers with male children in their arms on all sides were making their way through the streets to the gates to flee the city. For no decree of a King of Oas may be repealed, but is law forevermore.

The King sat upon his throne of skulls, gnawing his nails off his fingers, for he had either to slay his own son or say that a law once made by a king could be un-made.

If he allowed the law to be thus abused even by himself, such was the nature of his people they would have no respect for him, and might even kill him for a fool who could not enforce his own decrees when they hurt him a little.

So it was that when Asha presented himself before the King, So-qi asked:

"What shall I do, O Asha? My son has smiled in my face!"

Asha was prepared for this, and answered:

"Thou shalt send me and thy son and thy daughter's son and every male infant to the slaughter pens, and have us

all beheaded and cast into the fire! Otherwise it will come true as the infant Zarathustra prophesied: his hand will smite Oas city, and it will fall as a heap of straw."

So the king appointed a day for the slaughter, and ninety thousand male infants were adjudged to death.

Chojon, from the safety of the forest, made a scornful song about the tyrant of Oas who went to war against babes, and it was sung everywhere in the city, and the king could do nothing about it, for it was cleverly worded, seeming to approve, though in satire only.

WHEN the day for the slaughter arrived, there were but a thousand appeared with their babes out of the ninety thousand adjudged to death—all the rest having fled to the forest as had Chojon.

The King saw an excuse in this to get out of killing his own son, and stood pondering how to escape his own decree. His wife, Betraj, came before him, holding out her son, saying:

"Here, oh King, take thou thy flesh and blood and prove the inexorable justice of the King's decrees."

But the King said:

"Let the officers go and collect all the others who have fled beyond the walls, and until all are gathered here before me, no matter how long it takes, let the decree be suspended."

Now the God, Mazda, moved the soldiers' minds to see that their King had not the backbone to enforce his own decree when it hurt himself and they, one and all, took up stones and stoned the King to death.

Asha, standing stripped for the slaughter, was made King by the clamor of the men who stoned So-qi to death.

A great voice came out of the sky and announced to the people that God

had given them a new and righteous ruler. Asha bowed his head and accepted the task put upon him. The people gave thanks to Mazda, the God, and Asha proclaimed him to all the city.

Off in the forest, Too-che lifted her eyes to those of Chojon and thanked him for saving her son. And Chojon touched her with his fingertips, and kissed her on her lips, and the child crowed lustily to see their love.

These two walked through the Forest of the Goats, Too-che bringing beauty like a spring breeze with her, and

Chojon singing and touching his harp with magic fingers, so that joy and love walked before them, announcing them to the Listians—the people of the forest.

When Zarathustra, the infant child the woman bore in her arms, lifted up his piping voice and spoke to these rude wild people, their worship sprang into life—for surely these were Gods come to them. And thus, all the people gave up the worship of murder and became Zarathustrians.

THE END

WAR-TIME ASTRONOMERS



By WILLIS FEATHERSTONE



SEVERAL months ago this magazine published a number of articles on amateur telescope-making and amateur astronomers. They were so well received that we thought it of interest to point out some other activities of the group.

Amateur astronomers and telescope makers are usually of two breeds. The astronomers are more interested in actually working with the 'scopes and making observations. Much of the work they do has significance for the regular observatories and it is a matter of record that they have discovered quite a number of new comets. Amateur astronomy is well organized with numerous magazines serving their field.

But it is amateur telescope makers who are in the majority. These "telescopic-nuts," as they like to call themselves, are primarily interested in the mechanics of telescope making, optical science, and fine-mechanics in general. They come from all walks of life and may range from clerks and shop mechanics to physicists and university professors. They have one thing in common; they appreciate fine, precision mechanics, best described by the German word "Feinmechanik."

The two most common organs that serve them are the amateur telescope makers' sections of the two magazines, "Scientific American," and "Sky And Telescope." These journals publish articles and photographs of the products of their handiwork, telescopes, clockwork drives, mirrors, lenses, etc.

It is now estimated that amateur telescope-makers number in the neighborhood of several hundred thousand. Because it is possible to construct a complete reflecting telescope for less than

twenty-five dollars, anyone in the country is eligible practically to enter the field. All that is required is a pair of six inch discs of glass, some abrasives, water, patience and elbow grease. On the other hand, numerous amateur telescope makers are skilled mechanics of the first order, and the products they manufacture cannot be duplicated for thousands of dollars.

During the late war, these skilled optical and mechanical workers proved their value in national defense. Gunsights for large weapons require extensive elaborate optical installations, the heart of which is a special prism of glass known as a roof prism. This prism cannot be in error by more than a fraction of a millionth of an inch. It requires skill and patience to manufacture because it is so complex. The government called madly for volunteers to help provide the vitally needed prisms until it could set up a factory capable of building these prisms on a large scale. Amateur telescope makers responded.

The government supplied the glass and abrasives and the directions. The work was so difficult, that only a few dozen of the hundreds who applied were able to turn out satisfactory work, but these few dozens supplied hundreds of vitally needed roof prisms at a most critical time. Furthermore their work was unquestionably perfect. We do not know exactly what part these prisms played in detail, but they must have had a great effect.

Amateur telescope-making is the optical backbone of America and is in effect, an apprentice training system for skilled workers. The two hundred inch reflector was made to a great extent by amateur—"professional amateur!"

INTO THE VIBRATIONS VIA RADIO



By CARTER T. WAINWRIGHT



EVERY single physical object or structure possesses a peculiar property—it will resonate, or vibrate, or oscillate at a given rate determined by its physical size and mass. This is not a mysterious statement. We all know how it is possible to set a swing into very violent oscillation with merely a slight push applied at the proper time. We also know that it is possible for a bridge of steel and concrete to collapse beneath the constant pounding of marching men or rolling vehicles provided the resonant frequency of the structure is that of the forces acting on it.

A slight hammer tap at the right point on structure, say a building, can knock down that building if the blow is of the right frequency. We know this phenomenon as "resonance." In some cases, musical instruments notably, we make portions of them resonant deliberately in order to create a loud sound from a comparatively weak one. Thus metal chambers, columns of air, lengths of wire—all are resonant.

We have learned a great deal about resonance through the study of the science of radio engineering. For radio makes use of resonance more than any other subject. Without resonance there would be no radio or radar or television.

Now, you ask, what is resonance in radio? It is easy to understand the resonance of vibrating bodies, but what have they to do with radio waves? Directly, the answer is, nothing—but indirectly the same phenomenon is responsible.

People often ask how it is possible for a radio to pick out a given radio wave from the host of different frequencies that surround us night and day. The answer is dependent upon a number of facts. First, when a radio wave cuts across a wire or a coil of wire, it induces in that wire a small electrical voltage of the same frequency as the radio wave. Since all radio waves are doing this, it is obvious that any coil and any wire has in it thousands of different voltages. How do we discriminate between them?

The solution is, to make the wire or coil "resonant" to the given voltage. Much as we adjust the length of a pendulum to set it to a given frequency, a wire or coil must be tuned so as to be resonant with the desired induced voltage.

The way in which this "tuning" is done is familiar to anyone who has tuned a radio. A coil possesses electrical resistance we know. It also possesses a more important property from an electrical standpoint—inductive reactance. Induc-

tive reactance is the opposition offered to a current of a given frequency by the coil or the wire. This reactance is much greater than the simple resistance.

If we could neutralize this inductive reactance at a given desired frequency, the coil would offer slight opposition to the voltage induced by that frequency radio wave and voltage would be easily built up in the coil. The question is, how to neutralize the inductive reactance?

Fortunately the solution is simple. An electrical condenser possesses the electrical property which is diametrically opposed to inductive reactance—capacitive reactance. As a consequence, when a coil and a condenser are connected together and host of different voltage applied to them, a current will build up to great value in this "tuned circuit" at a frequency which finds least opposition in the form of impedance. Therefore the circuit will be resonant to a host of different frequencies, the desired one being selected by a simple twist of the dial of a variable condenser.

Such circuits, resonant circuits, appear in all radar, radio and television receivers. By utilizing their singular ability it is possible then to select radio waves, television waves or radar waves of whatever frequency we so desire.

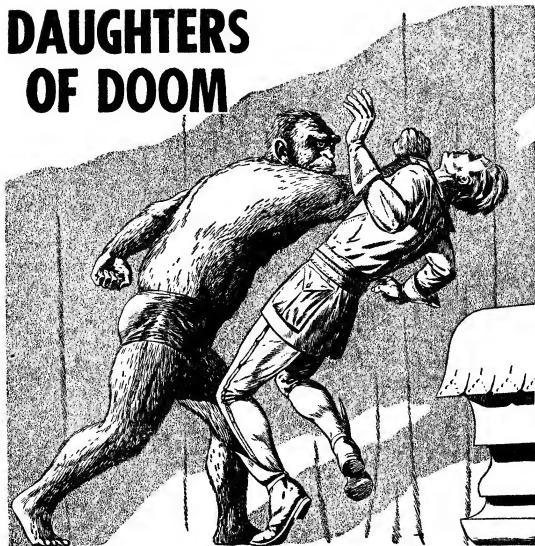
While we have used the example of a coil and a variable condenser to illustrate the point, by no means are all circuits tuned in that manner—though the principle of neutralizing inductive reactance with capacitive reactance is the same. Some circuits use fixed condensers and the reactance of the coil is changed by moving an iron powdered core in and out of the coil. This is done frequently in television receivers where the frequencies are moderately high.

In radar reception the tuning may be done by a simple changing of the length of the inductor much as one tunes a pendulum, or a metal cavity may have its physical size altered as one tunes a musical instrument.

Going back to physical resonance, a modern automobile must be carefully designed with associate springs and shock absorbers, lest it be resonant to the frequency of the road bumps it receives. When this happens, as it occasionally does over a particularly rough road, the automobile shakes impossibly and may even tear itself to pieces. The same is true of aircraft.

Resonance then is one of the most important of all physical phenomena which we study today.

DAUGHTERS OF DOOM



By H. B. HICKEY

Deep in space lay a weird and threatening world. And it was there that Ben Sessions found the evil daughters . . .

BEYOND Ventura B there was no life; there was nothing but one worn out sun after another, each with its retinue of cold planets and its

trail of dark asteroids. At least that was what the books showed, and the books had been written by men who knew their business. Yet, despite the books



The ape-like figure rushed forward and Ben's head was thrown back by a mighty blow . . .

and the men who had written them, Ben Sessions went past Ventura B, deliberately and all alone and knowing that the odds were against his returning alive.

He went because of a file clerk's error. More correctly, he went as the final result of a chain of events which had begun with the clerk's mistake.

The clerk's name was Gilbert Wayne and he worked at the Las Vegas Interplanetary Port. It was Wayne's job to put through the orders for routine

overhaul of interplanetary rockets. Usually Wayne was quite efficient, but even efficient men have bad days, and on one of those days Wayne had removed from the active list the name of Astra instead of its sister ship, the Storan.

The very next morning the Astra had been turned over to Maintenance. Maintenance asked no questions. It was that department's job to take the ship apart, fix what needed fixing, and put it. Ten minutes later Jacobs saw Ar-

mando Gomez was the mechanic detailed to check the rocket tubes.

Gomez, who always got that job because he was small and slender, dutifully dropped his instruments into his overall pockets and crawled into the left firing tube. Half an hour later he stuck his head out of the tube and yelled to Jacobs, who was in charge of the job:

"Amigo! How many hours this ship she got?"

Jacobs ran his finger down a chart and discovered to his surprise that the Astra had only two hundred hours on its log since the last overhaul. Ordinarily a ship was checked each thousand hours. He scratched his head but decided that if Operations wanted the Astra tuned it was none of his business. So he told Gomez not to ask useless questions and to get back in the tube.

Anyone else but Gomez would have obeyed orders and forgotten all about it. Ten minutes later Jacobs saw Armando's head appear.

"Amigo!" Gomez shouted. "How many hours?"

"Two hundred!" Jacobs shouted back, knowing he would have no peace until Gomez was answered. "Now get to work! We ain't got all year."

But Gomez was out of the tube again in five minutes and yelling for the foreman.

"What do you want now?" Jacobs demanded. He swung himself up on the catwalk beside Gomez.

"Something very funny in here, amigo," Gomez replied. "One plate she is too clean."

"Less work for you," Jacobs grunted. "So why complain?"

Nevertheless he took a look at the plate, which was near the mouth of the tube. It should have been lightly encrusted with the oxides of rocket fuel. Instead, it was only beginning to dull,

in strange contrast to its neighbors which were welded to it.

"That is queer," Jacobs muttered.

"Si. As you say, amigo. Queer."

Once Jacob's interest was aroused he was also not one to let a matter drop; he told Gomez to work on another tube while he consulted the front office. The front office was not especially interested, but at Jacobs' insistence they called in a metallurgist. The metallurgist, whose name was Britton, was fortunately a thorough young man. He ordered the plate removed and sent to his laboratory for complete analysis.

After that things happened fast. Britton scanned the analysis of the plate and without hesitation called in his superior who ordered a second test just to be safe, and then notified Washington. Washington turned it over to Interplanetary Intelligence, of which Carson was chief of staff.

One week later Ben Sessions stood before Carson's desk.

SESSIONS was only thirty-five, but in his few years with "Two Eyes," as the organization was known, he had rung up an enviable record. Tall, lithe, darkly handsome, he was well liked by the men who worked with him. At the moment there was a puzzled frown on his face, lengthening the line made by a scar which ran from his forehead down the side of his nose. The scar was the result of a crash landing on Neptune.

"I don't get it, sir," he said. "A single plate from a rocket tube . . . So what if it didn't oxidize?"

"That makes me feel much better." Carson smiled, an inner bitterness making the smile wry. "I didn't get it either," he went on. "A mechanic named Gomez got it; a foreman named Jacobs got it; a lab man named Britton got it; but the chief of 'Two Eyes'

missed the boat. I feel swell about that." He rose suddenly and hammered his fist on the desk. "Every one of us in Intelligence ought to be cashiered!"

"Take it easy," Ben cautioned. "All because of that plate?"

Carson slumped back into his chair. "Yes. And because we have failed in our duty. Our only hope is that we may have time to make it up. I'll give you the facts:

"Those tubes are made of Virium, but even Virium develops scale. After next week it will develop even more, because next week we make the change-over to the new fuel. If Wayne had made his mistake two weeks later there would have been so much deposit in the tubes that Gomez would not have noticed the difference.

"Now, Virium is one of the most standardized products in the world. So Gomez was rightly astonished that the tube didn't oxidize evenly. Jacobs saw further. Virium is the toughest metal we know of; if this piece was tougher it might be a discovery of major importance. So Britton analyzed the plate."

"Now we get to the point," Sessions grinned.

Carson stabbed a finger at him. "Right. And the point is that this one section of plate is not Virium! In fact, it is a substance which we are positive does not exist in our system!"

"Wait a second. What do you mean by 'system'?"

"I mean every single bit of matter that lies between here and Ventura B."

"Maybe it's not a natural substance. Not an element."

"We thought of that. It's an element, and one we know nothing of."

"Do you mind if I sit down, sir?" Ben asked suddenly.

The enormity of the thing had struck him, almost dazzling him with its im-

plications. Carson laughed bitterly and waved him to a chair, then went on talking.

"Precisely, Ben. The question is: How did this strange substance get into the tube of an Interplanetary rocket called the Astra? To answer that we checked on the ship. The Astra is one of the few ships which have ever gone beyond Ventura B!"

"I almost expected to hear that," Sessions said.

"It adds up, all right, doesn't it? A foreign substance, a foreign system. But this substance had been made into a plate. That means the work of intelligent beings."

"Who took the Astra on that trip?" Sessions asked, his body tense.

"A licensed space explorer named Murchison. Two others went with him but he returned alone. Claims they fell into a chasm."

"But no explorer has reported life beyond Ventura B," Sessions said, taking up the thread of thought. He whistled softly. "You must have been busy this last week."

"Busy is no word for it. It's only three years since anyone has been allowed to go outside our system. For the purpose of science Interstellar Flight granted permits to six licensed explorers. All returned with charts showing only a desolate waste. In our own quiet way we have checked on each of these six men, including Murchison, in the last week."

"And . . . ?"

"And we discovered something very interesting. The six who returned from beyond Ventura B were not the same six who went! They are identical in every facial, bodily, and mental characteristic, identical enough to fool even the families of the lost explorers. But when we secretly photographed them with infra-red light we found that their

skins contained elements foreign to our system!"

VENTURA A and its sister star were the twin beacons that marked the last outposts of the Earth System. Past them was only a trackless waste of inter-stellar space. Ben Sessions knew that the charts he carried were probably worse than useless, were likely down-right traps.

He and Carson had planned the trip. Carson had wanted to send a fighting fleet but Ben had opposed the idea. Wayne's mistake had led them to the uncovering of a gigantic hoax, a hoax which could have only a sinister purpose. Somewhere in the void ahead were sentient beings. To send a fleet would be to let them know that their existence was suspected.

Sessions let the automatic controls take over while he examined the charts once more. They showed the constellation which lay directly ahead, the one after that, and then nothing for hundreds of millions of miles. Those first two reflected a tiny amount of light from Ventura B and were visible through telescopes, therefore it would have created suspicion to falsify their position. Past them, however, the blackness was too intense to penetrate.

The speed of the rocket ship increased. Atomic blasts replaced those of the regular fuel. Sessions knew that an Earth measurement would have shown the ship to have shrunk to half its size. Only light and the radona beam which protected the ship from collisions could travel faster.

From now on it was just a matter of luck. Someone had pulled those six explorers out of space and Sessions was hoping the same thing would happen to him. On the third day it happened.

He was sitting in the pilot's chair, watching the radona chart before him.

Most of the chart was blank, only the upper right hand corner showing a mass of black dots which indicated a planetary dispersal about a dead star. Sessions waited for the radona beam to swing the ship leftward.

Instead, the ship was curving in the direction of the dots! Ben's first thought was that the beam had gone out of order, and he switched to manual controls. No use. Despite all his efforts he was being carried toward those planets.

Habit made him shut off the tubes. Why waste fuel? A tight smile froze on his lips as his speed dropped to twenty million miles then lifted again as the ship by-passed a planet. With calm deliberation Ben switched on the camera he had installed before the flight and let it record his course as shown on the radona chart.

Only one dot remained on the chart. It grew larger and larger until it filled the entire screen. There was no longer any doubt as to the ship's destination, and as if to add further proof its speed dropped sharply. Ben clicked the switch on the camera and removed a tiny roll of microfilm. The roll fit snugly into the hollow cap which covered the stub of one of his molars.

The altitude indicator went on automatically, showed fifty thousand feet, then forty thousand, went down to hundreds. Ahead there was only blackness. Ben held his breath and waited for the crash. It never came. Long after the altimeter showed zero the ship still moved. Ben could think of only one explanation: he was below the surface of the dark planet! And then he could think no more; the blackness seemed to filter into the ship and into his mind.

"HE AWAKENS," a voice said. It was a pleasant voice, a feminine

one, silky and soothing.

Ben Sessions sat up and said, "Huh?"

The first thing he noticed was the light. No more darkness, but a light that came from nowhere and yet was everywhere. He was on some sort of couch, in a huge room with a vaulted ceiling. Shaking his head groggily, Ben looked for the source of the silken voice. He was alone in the room.

His eyes ran down the length of his body. The flash gun was gone from his belt. That was hardly unexpected. But the belt was gone too. So were his clothes. He was clad in a loose robe of shimmering white cloth.

That meant he had been unconscious for some time. How long? Ben would have given much to know. Suddenly he let out an unearthly moan, threw his arms wide and rolled off the couch. He lay still.

The silken voice was raised again and added to it was another, more masculine. Then a door opened and two people stepped into the room. Ben sat up and grinned at them, especially at the woman.

"I thought that would get you," he said. "It's not hospitable to hide from your guest."

"Resourceful, isn't he?" The woman raised her eyebrows in mock admiration. Her companion growled a reply which Ben couldn't quite catch.

They were an odd pair, the woman towering well above ten feet but perfectly formed, her skin the color of pink marble; the man more beast than human. The women of Saturn were as tall as she, Ben had time to think, but not nearly as beautiful.

"Welcome to Teris, Ben Sessions," she said. Her smile was the smile of the serpent of Eden.

"You're pretty resourceful yourself," Ben grinned.

He had carried no papers except a blanket permit from Interstellar Flight. He wondered if the precaution he and Carson had taken would prove to be in vain. The woman spoke again.

"Ben Sessions, graduate of Neptune School of Rockets; born in Taos, New Mexico, Earth; third of four children; unmarried, unattached at present; first position, co-pilot Earth-Vega Express . . ."

She seemed to be choosing items at random from a memorized list. The exhibition was intended to impress Ben and it was succeeding. More than that, however, it was frightening. He held his breath as she neared the end.

" . . . two years with Interstellar Communications; presently a licensed space explorer, non-affiliated."

"Pretty good," Ben said.

It was better than that. It was perfect. Only the end was wrong. He and Carson had worked that out with the psychoanalyst. The two of them had wanted to falsify the entire biography, but the analyst had convinced them he was right.

"One lie I might attempt to pound into your very subconscious by hypnotism; a dozen would be spread too thin. We would leave holes. Under the type of electroanalysis you seem to think might be used on you I can't even promise one lie will hold up."

Ben reminded himself to recommend the man for honors if he ever got back to Earth. He had certainly known his business; but then, if he hadn't he would not be working for "Two Eyes."

"Now that you've told me all about myself maybe you'll tell me what's going on," Ben said.

"One of your compatriots can do that," the woman told him. Her interest seemed suddenly to have waned.

She said a few words in a strange tongue to the man who stood at her

side. He grunted, bowed, and advanced toward Ben. Long arms, covered with thick black hair, reached out. Ben dodged.

"You'll be sorry if you make him use force," the woman said.

"Nothing like trying," Ben told her. He avoided another grab and stepped in and smashed his fist to the hairy man's jaw.

He might as well have hit a wall. Before Ben could strike another blow he was lifted from his feet by an upward slap that threatened to tear loose one side of his face. Too dazed to resist, he felt both his wrists encircled by a tremendous hand. The woman's voice rose sharply in a tone of command.

THE CORRIDOR through which Ben Sessions was being led was thronged with people. There seemed to be three classes: rosy-skinned giantesses like his escort; men of his own size, but also with pink complexions; and the squat, hairy men who appeared to be nothing more than slaves.

It was plain that women dominated this society, and from them Ben received curious but contemptuous glances. Any one of these Amazons would have been considered a beauty on Earth, so regular were their features, but they lacked an air of feminine softness. Instead, cruelty lay thinly masked beneath the surface.

At the end of the long corridor a huge door swung open and Ben was led through it into an immense room. At the far end of the room was a throne, and on it a woman. Ben blinked. As well proportioned as the others he had seen; she was half again as tall, twice as beautiful. He could not contain a gasp of appreciation.

Thick violet hair fell almost to her shoulders, her skin was luminous and

flawless, her body breathtaking, more revealed than concealed by a clinging gown of some filmy material. At her breast, flashed a single violet jewel larger by far than the famed sapphires of Uranus.

"I brought him as soon as he awakened," said the woman with Ben.

A malevolent stare from the woman on the throne rested on Ben. "It was unnecessary," she said. "We have no further need of him. Take him to the field."

"Wait a minute," Ben snapped.

"You are addressing Arndis, Queen of Teris," he heard his escort say.

"I don't give a hoot . . ." He never finished the sentence. From behind the hairy slave seized him, lifted him and flung him bodily toward the doors. The interview was over.

They went for a while along the same corridor, then turned off and followed a side passage for a way. It led steadily downward to an arched opening and through that out of the building. Here too the light was diffused, but much brighter. Ben had to blink several times before he became adjusted to it.

They were standing in the center of a vast level plain, apparently endless and roofless, for overhead there was no sky, only an increasing intensity of light. Ranged in rows on the plain were thousands of space ships. Ben turned once as they approached the first line of ships and saw behind him the building from which he had just come. It rose upward, a single block of shining stone, for almost a mile. Alongside it were other buildings of the same material, but none so large.

Then Ben and his two escorts were past the first rows of ships. His eyes roved over them, trying to discover what armament they carried. None was visible. Their firing tubes were much the same as those of Earth de-

sign, but slightly smaller.

His attention was diverted from his study by a sudden disturbance aboard the closest ship. The sound of an angry feminine voice came clearly through an open porthole, and mingled with it was a pleading, deeper tone. An instant later a door was flung open and out of it came hurtling one of the men of Teris. He hit the ground, rolled over, and came to his knees facing the open door and the giant woman who stood framed in it.

THAT the man was pleading for his very life was obvious to Ben, but it was equally plain that his pleas were having no effect. The woman on the ship uttered a single contemptuous word that cut the pleas short. On her face was a sadistic anticipation such as Ben had never before seen. Slowly she raised a cylinder in her hand and pointed it at the man on the ground.

From the cylinder came a violet light, weak at first, but growing in intensity as she pressed some sort of trigger. The man shrieked in agony as the light played on him. Then the smell of burning flesh came to Ben's nostrils, and the shriek became a single high pitched scream which choked off suddenly.

Ben's escort laughed with ghoulish enjoyment, said something to the woman in the doorway, and gestured at the charred body on the ground. The violet light grew to blinding intensity. A puff of smoke and the body was gone.

"What was that for?" Ben gasped.

His escort smiled indulgently and shot a question at the other woman. The reply was a shrug of shoulders and a few short syllables.

"He did something that displeased her," she told Ben. At his look of horror she laughed again, apparently pleased to have shocked him.

He noticed, as they went along, that

the space ships decreased in size. Those in the first rows had been comparable to Earth's battle cruisers, those in the last were one or two man jobs. His own ship, the *Rapier*, was at the very end of the last line.

Beyond was a vast army of men, both rosy skinned and hairy, at work on a gigantic excavation project. Great power shovels scooped load after load of earth. But most of the work was being done by the men who labored with primitive pick and shovel.

Above the sound of digging rose the sharp voices of the giant women of Teris, each with a battalion under her command. As far as Ben's eyes could reach men were digging at the ground.

He was hustling along to a point where a dirt spattered group struggled with a metallic lining for the half-mile hole it had excavated. At that point his escort turned him over to the woman who bossed that crew. Ben saw in the hand of the overseer one of the violet ray cylinders.

"Down there," she said curtly, pointing to where a small knot of men worked on a terrace fifty feet below. "They will tell you what to do."

Ben had found nothing strange in the fact that his escort had spoken English fluently. She had been present at his electroanalysis. But he doubted that all the women of Teris could have the same command of the language. Nevertheless he said nothing and clambered down the ladder to the terrace beneath. Ben's unasked question was answered when he saw the five faces turned up toward him.

EARTH men! Even the grime that covered them could not hide that. And there was added proof in their widening eyes. They were sorry to see another Earth man captive, yet happy at sight of one of their own kind. Will-

ing hands helped Ben down from the bottom rung of the ladder.

"We'd heard they had picked up another ship," one of the men said. "But we weren't sure the rumor was true."

"True enough, as you can see. I'm Ben Sessions."

His outstretched hand was grasped and shaken cordially. Names were flung at him. Murchison, Davies, Kennard, Bannon, Murchison.

"Wait a second," Ben said. "I thought I heard Murchison twice."

"You did," said the big, rawboned man at whom he was staring. "The first is my daughter Sally."

It was only then that Ben noticed how small and slender was the figure of the one next to Murchison. Even the girl's loose robe, similar to that of the men, could not quite conceal her femininity. Her hair was cut short, her hands toil hardened.

"Carson didn't tell me," Ben muttered. He grinned at Murchison. "I expected to find you and two assistants, but I didn't know one would be your daughter."

"Expected—?" Hope glinted in five pairs of eyes. Above them there was a shouted command to get to work, and a cylinder was waved threateningly.

"I'll explain as we go along," Ben said hastily. "Show me what to do."

Bannon, a short, thickset man with a mop of unruly black hair shoved a pair of tongs into Ben's hands and quickly explained how to hold the rivets with which the group was working. In effect they were constructing a huge cylinder. Looking down, Ben saw that it descended into the bowels of Teris.

The others were pressing Ben for his explanation but he insisted that they tell their stories first. The same thing had happened to them as to him. Within some thousands of miles of Teris they had felt a force pull them toward

it. Then they had passed out and awakened to find themselves prisoners.

"I know all that," Ben said. "But in all the time you've been here you must have found out a good deal. What goes on here? Why are they taking prisoner every one who approaches the planet? Why do they conceal its existence from our system?"

Murchison paused between blows of his hammer, as though to wipe sweat from his brow.

"Since you seem in a hurry," he said, "I will tell it in brief. You are in the center of a planet whose evil people are engaged in one enterprise: the conquering and subjugating of our universe."

"I thought that might be it," Ben nodded. "But subjugating billions of people may prove tougher than they think."

"Their intention is to reduce our population so it can be easily handled. And I can assure you that these women are perfectly capable of slaughtering as many people as they think necessary. They have both the means and the contempt for human life that such an undertaking requires."

Ben hazarded a guess. "This project is part of their preparation?"

"The final part. Since the surface of Teris has a temperature of absolute zero it can only be reached from here through a series of locks. What they are building now are new locks big enough to handle their largest ships. As soon as that's done they plan to attack."

"Any idea when that will be?"

"About a week, Earth time." Murchison's shoulders sagged with despair. "We've been wracking our brains for a way to stop them, but it's no use. They're as clever as they are evil. They've even sent doubles of each of us men to Earth to pave the way for the

attack. I suppose you've seen your double."

"No."

"Then they haven't made one. You have to be awake while it's being done. I suppose they didn't think it necessary now that there's so little time left."

"Less time than I thought," Ben grunted. "I'd better get moving." He tilted his head back and shouted to the woman above.

FOR A second time Ben stood before Arndis, queen of Teris. Her eyes probed at him, trying to divine his thoughts. There was anger in those eyes. If she detected a single flaw in his story it would mean Ben's death. More than that, it would mean disaster for Earth. He talked fast.

"When we found that plate in the firing tube of Murchison's ship we knew he was lying. We figured he'd discovered valuable deposits out here and was trying to keep them secret."

"That was all?"

"It's enough, isn't it? Enough for Interplanetary Intelligence to send me on this mission. Those false papers I carried are proof that we suspected something. And if I'm not back in the time we allowed they'll have our entire battle fleet out looking for me."

"Very clever," Arndis smiled. "But if you are trying to frighten us you are failing. The women of Teris had a high civilization before your Earth was born. We can do things you never dreamed of."

At her command Ben's arms were seized and bound behind him. He was carried swiftly into a room nearby, a room filled with a maze of scientific apparatus. On what appeared to be an operating table was a transparent shell, and beneath this Ben was strapped.

Through the shell he saw one of the men of Teris brought into the room and

placed in a similar position on another table. Wires were strung between the two shells and somewhere a machine began to hum. The shells filled with a white vapor that lingered a moment and then was gone.

Although he had known what was to happen Ben could not control his amazement. For the man who came out of the other shell was an exact replica of himself! Within minutes he saw the other dressed in his own flying suit.

"You see how simply we solve the problem?" Arndis asked. "Ben Sessions will return to Earth and there will be no search. He will report that he found nothing and request that he be allowed to try again. By that time we shall be ready to attack."

Ben's arms had been untied, and now he put his hand to his face, as though to rub some tender spot. The move attracted no undue attention. An instant later he had two fingers inside his mouth and was working loose the cap over his tooth.

His next move took them completely by surprise. With a leap he was half way across the room and lunging for his double. Ben brought the man down with a flying tackle and for seconds they wrestled on the floor. Then a hairy hand tore Ben loose and he was hauled to his feet. He had done little harm to the other.

"Not quite fast enough," Arndis said. "Within minutes he will be aboard the Rapiet and on his way." Her voice rose. "Take this one back to the locks."

"DOESN'T it ever get dark here?" Ben asked.

He and Murchison and the others had been allowed to come out of the tube after what seemed hours of toil. They sat now in a tiny cell into which air came through slits in the wall.

"No," Murchison said. "But Bannon has a good watch and we're able to keep track of time. It's exactly six days and three hours since you were put to work."

Ben nodded thoughtfully. There was not much time left. Work on the locks went on endlessly, and sooner than he could have believed possible they were being completed. Given enough slaves, he thought, anything could be accomplished.

Gluing his eyes to one of the slits, he peered out. The last of the giant gates was being installed. Their own crew would have only one more shift before the job was finished.

Beyond the excavation Ben could see the tower from which the locks were controlled. Bannon, who had been in Teris longest and who had managed to garner some information, had explained their operation to Ben.

"I worked on the new controls when they were being installed," he said, ranging himself alongside Ben. "They're fully automatic. There are five locks in each tube between the interior and the surface of Teris."

"How many ships did you say were kept at the tower?" Ben asked.

"About ten. They make inspection flights each day, although nothing has ever gone wrong that I've heard of. But the tubes and the locks are the only outlets to the surface and they watch them carefully."

"What are our chances of getting to the tower?"

"Zero, I should say. Only the women are allowed to enter it, or a small crew under their supervision."

"Willing to make a try?" Ben asked. He swung around to face them all. Until now he had not taken them into his confidence, given them no inkling of what was in his mind.

"We've talked about it before," Mur-

chison answered. "But there's so little chance we gave up the idea. Better to stay alive and hope for a rescue."

"I can't tell you how I know," Ben told them, "but there isn't going to be any rescue." He kept his eyes on the girl. "How about you, Sally? Willing to trust me?"

She nodded and Ben heaved a sigh of relief. Rather than leave her behind he would have stayed with her. Gathering them about him he outlined his plans. The men were more than skeptical but no one had any suggestions.

BEN and Davies were the last to finish their work, and as they fastened the last rivet to the last hinge Ben looked up and shook his head. To the giant woman who stood watching him it seemed only that he was tired. She failed to notice that Sally had drifted off to one side and was coming up behind her.

Sally's foot suddenly caught the overseer just behind one knee and knocked her off balance. At the same instant Ben stepped in close and wrenched the violet ray cylinder from the woman's hand. The others screened them from sight. Ben looked around and saw that the slight flurry of activity had gone unnoticed by others of the giant women who were nearby.

"We're going to walk to the control tower," he told the woman grimly. "If anyone asks you're to say we have to do some work there. I'm going to have this ray gun trained on you under my robe, so don't try any tricks. Understand?"

She understood all too well. A flicker of fear in her eyes told Ben that she knew he would blast her without mercy. They fell in behind her.

When they reached the doors of the tower a pair of women barred their

way.

"We have received no notice of work to be done," one of them said. Ben saw her eyes narrow with sudden suspicion, and then her hand darted for the cylinder at her side.

Ben's ray gun spouted violet death and the charred bodies of three women lay in the doorway. Ben scooped up their guns and thrust them at Bannon and Murchison.

"We'll give you five minutes before we take off," he shouted as they ran past him for the control room.

Behind him and Davies and Sally there were shouts as the two men went into action. But they had their own job to do. The closest inspection ship was several hundred feet away and already women were running to cut them off. Ben cut loose with his cylinder before they had a chance to use theirs.

Then he and Davies were lifting Sally into the ship. While they covered the open door Ben ran for the controls. Somewhere an alarm was wailing and as he swung the ship about Ben saw other ships being boarded. But Bannon and Murchison had not failed. Just beyond the tower a lock swung open.

Ben skimmed along the ground, figuring to pick up the two men as they came out of the tower. Then he saw Murchison wave him on. He had planted himself in the doorway and was refusing to budge. Ben saw why as Murchison blasted away at a group of giant women who were trying to rush the tower.

There was no more time. Already other ships were taking off. Another wasted minute and they would beat him to the lock. Ben yelled to Davies to close the hatch as he turned on the power.

A moment later they were in the blackness of the tube. Davies ran for-

ward to the controls. "There's a light on the ship," he said. He found the switch and threw it in time for them to see the next lock open for them.

"Three to go," Ben muttered. "Looks like we're going to make it."

"Maybe not." Davies tapped his shoulder and pointed to the rear of the ship. Looking back through a port-hole, Ben could see other ships behind them.

"As long as we're in the tube they won't fire," Davies said. "But neither can we get very far ahead!"

While he spoke the ship had gone through another lock with the others still directly behind. It looked like Davies was right. But Ben was not yet ready to concede defeat. The fourth lock loomed ahead and he watched it swing open. Just a few minutes more and they would go through the last one. It was still hundreds of miles ahead but at the rate they were travelling they would be on it soon.

He waited until the last possible second and then cut his speed sharply. Behind them the other ships were forced to use their retarding rockets for fear of ramming them. It was just what Ben had expected. As the last lock opened he threw the accelerator all the way forward and felt the ship leap ahead.

That alone would not have been enough, but as the ship roared out of the tube above the surface of Teris he cut sharply to the right. Had their ship been faster it might have worked. But it was not fast enough. Through the blackness of space the exhausts of their pursuers flamed closer. Ben's teeth clamped down on his lips.

"I guess we're out of luck."

There was nothing more to say. It was only a matter of minutes before the guns of the ships behind them would blast them to pieces. They held their

breath and waited, watching the exhausts come through the darkness.

And then suddenly there was no more darkness. A light as bright as the noon sun flared. Ben let out a shout, for beyond the light were lined the battle cruisers of Earth. His pursuers turned tail and ran.

"Where the devil did those ships come from?" Davies gasped.

"I sent for them," Ben told him. "We had it all arranged. When I tackled that double I managed to slip a microfilm capsule into his pocket. It had a complete picture of my radona

chart. As soon as the double reached Earth, Intelligence grabbed him. All they had to do was follow my chart to Teris."

They were passing the flagship of the Earth fleet, and Ben dipped the nose of his ship in salute. Then he turned to see what was going on.

There was going to be no attempt to invade Teris. Instead, its surface was illuminated with more of the flares. A moment later Teris was gone, blasted by the guns of a thousand cruisers. And for the strange women who would have enslaved a universe, Ben felt no pity.

THE END

THE CRYSTAL SET IS COMING BACK



By PETE BOGG



THE early crystal detector of the beginnings of radio has made a come-back in the last ten years. Many people today still remember their little crystal receiving sets, made up of a pair of headphones, a coil of wire, and antenna, a variable condenser—and a little chunk of lead sulphide or galena. The purpose of the crystal was to rectify, that is, to change the high frequency alternating current to pulsating direct current. When the vacuum tube was invented, it displaced the crystal and it wasn't seen for a long time.

But when radar, and ultra-high frequency radio came into being, it was discovered that tubes gave a great deal of difficulty. For one thing, because they behaved like condensers they shunted high frequencies right across themselves without doing their job.

A solution had to be found—and was. Out was dragged the little old crystal detector. Because of its tiny size in comparison with a tube, it had little capacitance and it worked like a charm. A few refinements were made, such as sealing it in a cartridge so that the old "cat's-whisker" needn't be played with.

Now crystals are used on a wide scale in place of rectifying tubes, in high frequency radio and radar work. It might be mentioned that these crystals, contrary to a common erroneous impression, bear no relation to the crystals used to control the frequency of transmitters.

Another old-timer that came back into the picture was the selenium rectifier. This gadget was known long before radio tubes were invented. Sandwiched between two conducting metal slabs,

a chunk of selenium also has the property of rectifying alternating currents. It is capable of handling large currents. In most radios, the power supply uses a rectifying tube to convert the alternating current of the house line into direct current necessary for the operation of the radio.

But in the newer sets, and particularly the smaller and portable ones, a selenium rectifier is substituted for the tube. What advantages has it?—first, it doesn't get hot like a radio tube which melts and cooks everything near it. Secondly it starts to work immediately instead of having to warm up. This means that as soon as the set is turned on, it's delivering a program.

Last but not least of the crystals brought into use is the germanium transducer. It is the little crystal previously discussed in this magazine, which has the unique and startling ability to amplify a signal just like an amplifying radio tube! This astounding property has been put to use already in a variety of applications. What makes it so fascinating is that it requires no power supply either—no heated filaments, etc. Furthermore physically it is minute, being less than an inch long and having the diameter of a cigarette. Imagine something like that incorporated in with a printed circuit, the crystal mentioned above—and what have you?—Dick Tracy's wrist-watch radio is no fantasy—it has been built. Soon it will be commonplace.

The more applied science is studied, the more it is realized that there is no limit to man's ability to change his environment. Now, if he could get himself organized socially . . . morally . . .

RADIOACTIVE SCOOP



By LESTER CREELEY



WE DON'T want to break our arms patting ourselves on the back, but we've just done it again! Very often we managed to announce some new idea just before it appears. A few months ago we ran an article on one of the simplest sorts of radiation detectors—a fluorescent screen. We pointed out how Lord Rutherford was able, way back at the beginning of the twentieth century, to make counts of disintegrating atoms in radioactive material. Now we find out that the same situation is being used to make a modern atom counter.

When certain substances like barium sulfide and other similar compounds are hit by radioactive elements, or the parts of those disintegrating elements like alpha particles or electrons, the chemical gives off a minute flash of light. If this is observed in total darkness, the eyes well rested, and care is taken, the individual radiations may be seen. It was suggested in a previous article that a luminescent watch dial of the radium type is a perfect example of this and that the home experimenter should try it out by deliberately watching his wrist-watch in a darkened room under a magnifying glass. Several experimenters in the current *Review Of Scientific Instruments*, have gone the idea one better.

They have built a little apparatus for detecting

radiation—a substitute for the Geiger-Müller counter which is so famous. The basic apparatus is quite simple. It consists of a multiplying phototube on which—the outside of course—a sensitive zinc sulfide screen is cemented. Over this screen is a hemispherical mirror which has a hole in it. Now when this phototube and its associated parts are brought into an area in which there is radiation, like x-rays, alpha particles, high speed electrons and so on, these particles pass through the hole in the mirror and strike the zinc sulfide screen. Naturally light is emitted. This light is focused by the mirror onto the cathode of the phototube and of course sets up an electric current. It is a minute current but by the time it has passed through the multiplying phototube it has attained a sizable value.

The output of the phototube is then fed through a suitable circuit to a meter or an oscilloscope and each pulse of radiation can be seen and measured. This is the basic purpose of a G-M counter so it can be seen that science has another device for doing such work.

Because no high voltage supplies are necessary, as in the G-M counter, this phototube counter should be ideal for portable work.

Just call us prognosticators—we can't help our insight—prognosticators—not prevaricators!

GREAT TREASURE



By R. M. DETTMER



WHEN war is raging throughout the world, and your enemies may pounce upon you at any moment, people and even governments often try to hide their valuables. Conquering armies have been known as souvenir hunters since the time of Julius Caesar. The greatest treasure cache of modern times was found by the Allies in a Bavarian salt mine during the last war. There was much gold, beautiful paintings and tapestries, sculpture, and jewels, that had been stolen by the Nazis from all over Europe. They had hidden it away in the dry air of the salt mine where no moisture could harm their precious loot. The British Museum has thirty-three articles of silver that were found in a sugar beet field in Sussex in 1942. The designs on the bowls and plates showed that they were made in the days of the early Romans. They were unearthed by a plowman near the town of Mildenhall, and caused a great deal of excitement. The experts claim that the silver dates from the fourth century A.D. At that time the great Ro-

man Empire was breaking up, and Briton, on the outer rim of the empire was left to defend herself from the Picts, Scots, and Saxon raiders that came in from the sea. Mildenhall is not far from the North Sea, and probably the villagers knew that the raiders were on their way pillaging and burning as they came. The family with the silver must have felt that it was too heavy to carry with them as they fled, so they buried it in their garden intending to recover it when they came back after the raiders had gone. But for some reason they did not come back. There it lay for 1,500 years, and while the bombers of World War II passed overhead, the little man with the plowshare brought it to light again.

These pieces have much more than a material value, for they were conceived, shaped, and decorated by the hands of men of the ages. When you think of all the years that men have been hiding their riches in the ground, there is no doubt that the supply will last for several generations of treasure hunters to come.



VALLEY of the CROEN

By LEE TARBELL

**There was a mysterious golden statue that
always pointed one way—and it led to sudden
death in the valley where flying disks landed**

THEY say cross-eyed men are bad luck. He stood there, in my doorway, eyeing me up and down with those in-focused black eyes.

His face was hideous even if the eyes had been normal. He was slashed with a wide cicatrice of livid scar tissue from one cheekbone across his nose and

down to the button of his jaw on the other side.

He was big, and he looked like bad news to me. I inadvertently moved the door as if to close it, then he spoke: "You Keele, the mining man?"

I nodded, wondering at the mild voice from the huge battered figure.

"Been looking for you. I've run across something I wouldn't tell just anyone. But I've heard of you, that

Like a lodestone drawn to a magnet, the tiny golden statue leaped from his hand and darted toward its huge counterpart.



you are on the level. Here in Korea, you're known already."

I still didn't step back and swing the door wide. But he had aroused my curiosity as well as my natural desire to acquire things. I had made two fortunes and lost both in mining ventures. My present not small income came from an emerald mine in the Andes. It had been a very dirty and very sick Indian who had led me to that emerald mine. You never know!

"I'm pretty busy, could you give me some idea . . ." I hedged. It doesn't do to seem too anxious or eager in any business deal. Too, the sight of his burly figure, even without the nightmare face, was not exactly reassuring. That bulge under the native quilted coat, I knew was nothing but a gun too big for even his bulges to conceal completely. But a man needed a gun, here. Especially if he had something valuable, such as the whereabouts of gold.

He grinned, and the white, even teeth, and the wrinkles around his eyes took away the sense of impending catastrophe brought by those crossed eyes. I stepped back then, and he walked in. I sat down at my desk. He sat down across from me, and fumbled in one pocket. He lay on the desk an object in wrappings of dirty rags. These he peeled off slowly, his eyes seeming to dart here and there, never looking where they should. As he peeled, he talked:

"I just landed off a ship from Fusan, up-coast. Y' ever been in Fusan?"

I shook my head, watching his fingers work at the knots of the strings around his mysterious object.

"Korea is a funny place. As long as people have been living here, you'd think it would be settled. But it isn't! There're immense forests, great mountains, where no man has gone, places no one enters. They're so dumb they don't

even have compasses; they get lost! Think my compass is magic, wonder how I know where to go next, and not get lost. Superstitious, scared to go into the great, dark, damp forests. Scared of the mountains no one has ever climbed. That kind of country is a prospector's meat!"

I nodded. He had the wrappings off, and I leaned forward, a little breathless at the beauty of the thing in his hand. A curiously wrought little statuette about eight inches high, of gold. It was set with real emeralds, for eyes. About the neck and waist of the exquisite female figure were inset jewels, simulating girdle and necklace. A little golden woman goddess! It was very finely wrought, and what surprised me, it was not oriental, not any style of art I could place. Yet it was alien and ancient. I reached for it. He let me take it in my hands, and as I touched it, an electric tingle of surprise, a thrill of utter delight, ran up my arm, as if the image contained a strong little soul intent upon enslaving me with admiration.

"Potent little female, isn't she?"

HIS crossed eyes were on mine with that queer stare of the cross-eyed. I could make nothing of the facial expressions of this man. He would have been disturbing to play poker against. I would have said he was afraid of that little figure! Afraid, yet very much attached to it. I set it down and he wrapped it up again.

"Strange thing! Tell me about it."

"You know we split Korea with Russia, after the war. I thought I'd take a look around. I have done quite a bit of that. It wasn't hard. Up near the Russian line I found something."

He stopped, looked at me. Whether he was trying to gauge my credulity or my depth, I don't know.

"You're young. You're not yet

thirty, Keele; you've got time left to enjoy a fortune such as I'm letting you in on. And I saw such women among these unknown people as no man would believe. I spent a lot of time spying on them."

I figured he was lying about the women to get me to help him finance the trip. But just the same, the hint of unknown and unspoiled beauty of some hidden, weirdly alien tribe of people aroused my curiosity—the old lure of the Savage Princess from kid days, I guess. I hadn't had a real vacation in years—and what would I enjoy more than a jaunt through untouched forests? Toward what didn't matter as long as the hunting was good. And it sounded good!

"Unknown people, virgin forest, beautiful women and plenty of gold. Sounds too good to be true!"

He squinted at me, bared his fine teeth. He leaned forward, almost whispered trying to impress me:

"The people who made that statue are still there. It isn't ancient—they still make them!"

Now I knew he was lying, but still I was hooked. I had to know! For that statue was an infinite evidence of a refinement of art culture rare on earth! If such a race still remained untouched by white man's modern rot—I could pick up a fortune in art objects. I wasn't too dumb to know what they'd bring in New York. I nodded, and he went on.

"I found a cache of valuable gold, jewels, and other things. Things I can't understand. I could be better educated, Mr. Keele. That's why I've come to you. I want some help."

I leaned back. If he found gold, he should have the wherewithal to get in there and back without my help. So he was lying. I determined to find out why, and just what the lie was.

"Go ahead," was all I said. Give a liar enough rope and he'll trip himself.

But he didn't! He didn't ask for money! He only wanted me for advice, for the names of experienced men of the kind he needed, to help him go back there. Men willing to fight if needed. Or else he was too clever. At the end he had me. I was committed to supervising and accompanying that expedition. Or was it the wise emerald eyes of the little golden Goddess that trapped me? I didn't know, then.

Finally I got it out of him. He hadn't brought back the gold. He had to cross bandit territory, and he didn't have to tell me why he didn't carry his fortune with only his own rifle to guard it.

I picked two well-known men who were available just then. Hank Polter had led more than one hunting party through country I wouldn't have picked—and come out safe. He knew what a gun was for, and when to use it. And that's the most important part of handling a gun, knowing *when* you have to shoot, and then doing it first. The man that shoots before he has to is going to get you into more trouble than he can get you out of.

Lean and tough, he knew the ropes. Around thirty, just under six feet, not bad looking, he was making the most of Seoul's wide-open hot spots. Nearly broke, he jumped at our offer.

Seoul is the capital of Korea, in case you don't know. Everyone did pretty much as they pleased, for there were few restrictions from the so-recently installed government. There are a number of gold mines around Seoul, which was why I was there. Like the cross-eyed Jake Barto, I knew that something would turn up worth owning where governments have changed three times in as many years.

Frans Nolti, the other hunter we hired, was more of a fortune hunter, by

appearance, than one who knew his way in the jungles of the world. Handsome in his Italian way, he was suave, apparently well educated, very quick in his movements. He gave the impression of extreme cleverness, of intellect held in reserve behind a facade of worldliness, of light clever talk.

Both of them knew their Orient, far better than I. Which was one reason I wanted them.

BARTO had at first wanted a large party, at least a score of "white" men of the western school, able to fight and smart enough to know how. But I had talked him out of it.

"You see, Jake, with two like these, we can travel fast. If there's treachery, if they aren't satisfied with the cut we're offering, why it's two against two—you and I have an even chance. With a larger party, we might pick up some scoundrels who will try to murder us and make off with the treasure. Providing we *get* the treasure!"

Jake eyed me, in that maddeningly unreadable cross-eyed expression of cold ferocity which the scars gave his ugly face. We had agreed on one-third each, the other two to split the other third between them. I was footing the bills, Jake was nearly broke. He had found the stuff, and tried to hold out for half, me a quarter, the other two to split a quarter. I said nothing doing.

"No, Jake, this first trip, it's got to be this way. If it's like you say it is, there'll be more. What we can carry won't be all the value. There'll be more to be gotten out of that ruin than the stuff you found. You'll have the money to do it, after this, and it's your find. We'll be out, after this one trip."

We sailed up the east coast of Korea from Fusan to the village of Leshin. By native cart from there to the ancient half-ruined city of Musan. That's

close to the Manchurian border. There we hired eight diminutive Korean ponies and four men to "go along" as Barto put it, for they didn't want to go, and didn't appear like men of much use for anything but guides. And Barto knew the way. But I didn't want to be wandering around without any native interpreters, without contact of any kind possible with the people we might encounter. None of them had been more than a few miles into the wilderness. They were sad looking men when we started northward. But Koreans manage to look pretty sad much of the time. With their history, that's easy to understand.

Something about the burly, ugly Barto's behavior began to worry me. He didn't know where he was going. He had told a lie, but just what the lie was I couldn't figure out. I watched him covertly. Whenever we came to the end of a march, instead of sighting his landmarks, making sure of his bearings—he would go off by himself. Next day, he would know exactly where he wanted to go—but sometimes the "way" would be across an impassable gorge, a rapids, or straight into a cliff.

One night, the fourth day and well into the wilderness, we were moving up a broad valley through a forest of larch. I sighted a deer, and called a halt while I stalked it. I got it, and came back ahead of the rest, who were cutting up the deer. I moved quietly in the woods—it's a good habit. I came upon Barto, and he was oblivious of me. He had the little golden girl in his hands, talking to it.

"Now, tell me the way, girl, tell me the way." Then he held the girl loosely in his hand, as I watched, it gave me an eerie feeling to see the little figure turn, its outstretched hand pointing northward like a compass. Was Jake Barto a madman? Or *did* the little figure act

as a compass? If so, why did Barto have to rely on the pointing figure's hand for directions? If he didn't get that figure from the place we were heading, where did he get it? How did he know there was anything of value in the place we were headed for?

These questions tormented me, for I could not ask them without revealing to Jake that I knew he was lying. And that meant a showdown. I might have to kill him. Still, I had to get the truth out of him, or let a madman lead us on and on into an untracked wilderness, if that is what he was.

FOR several days we did not see a sign of life, after that deer.

The forest became denser at every mile, with more and more swamps and surface water. Time after time our ponies mired and had to be lifted out of the mud. Lush ferns and rank grass made walking dangerous. The trees were interlaced with draping festoons of gray "Spanish moss," forming a canopy overhead which let through only a gloomy half-light. No sounds broke the stillness except the half-awed calls of the men. No birds, not even a squirrel. Then it began to rain.

That drizzle continued for a week! The men became frightened at the gloomy stillness and exhausted by the strenuous work of keeping the ponies moving.

Then in the night my four Koreans deserted. They didn't take any ponies, just what grub they could pack. We all felt better off without them, but I often wonder if they ever found their way out of that morass.

The next day there came a break. We sighted a majestic mountain about two days' march ahead. It looked like a gloomy cloud that had settled to earth for a moment's rest. But no cloud ever managed to look so

rocky, so windswept, or so welcome. And no patch of blue sky ever looked so good as that sky above the mountain, swept clean of the rain curtain by the updraft.

Jake seemed to recognize that mountain, gave an audible sigh of relief when we sighted it. My suspicions quieted.

We went hunting that day. It was the first dry camp in a long time, the first signs of game; we needed a rest. As usual, Barto stayed at camp to guard the ponies and camp equipment.

We were on the trail of a bear when we saw a strange object in the sky. It looked like a doughnut or a saucer, and it settled to the earth on the far side of the great white mountain at whose foot we had made camp. It seemed only an hour's walk to a point where we could overlook the landing place of the strange object, and Hank and Frans pushed ahead, curious and a little frightened. I had read in the American newspapers the accounts of "disk ships" and knew they would not be able to get close to it, and I wanted to watch Hank. I let them get out of sight, then turned back to camp. Quietly, I was nearing our camp, when the scream of a woman in pain came to me!

It was the answer to all my apprehensions about the ugly Barto, a sudden materialization of the vague distrust I had felt all along! I broke into a run, crashing through the young, white birches and larches, to the clearing.

A chuckle reached me, a gloating heavy laugh of triumph.

Barto had the girl prone, one arm bent near to breaking, her knees caught beneath his weight. I caught him by the shoulders, heaved backward, sent him sprawling across the young grass. He sat up, glared for an instant, then went for his gun. Before it came out of the holster, my foot caught him be-

side the jaw. He was too big for any other method I might have chosen to be effective. The kick stretched him unconscious; my heel had struck the button.

I turned, to see the girl disappearing among the brush. She had darted away instantly she was free. That she would bring her people down on us I had no doubt. I did doubt their ability to hurt us. Unless she belonged to a band of Manchurian bandits hanging out here in the wilderness, they would not have arms. In the case she was of the bandits, we might be wiped out in our sleep.

I bent over Jake, hoping I had not broken his neck. He looked as though he would be out for some time. I picked up his heavy .45, shoved it in my belt. I wished Hank and Frans would return soon. The four of us might be able to handle her people.

I turned—and *she* stood there, looking at me!

* * *

THAT such as she existed among the usually ugly Koreans and Manchurians was impossible! I gasped a little in unbelief. Her clothing was like nothing on this earth.

Soft green leather was clasped low on her hips with a narrow gold band, set with jewels. It was a skirt, I suppose, but it hung with a diagonal hem-line running from hip to knee, it was beaded in an intricate pattern, not Oriental, somehow reminding me of American Indian bead work.

On her feet leather sandals, laced like the ancient Greek sandal nearly to the knee. In her hand a bow of horn, small and powerful. Around her shoulders a short leather cape similarly beaded and fringed. Around her brows a jeweled circlet set like a diadem, and it crowned a young queen, proud and knowing very well her beauty and its

power.

Her features were neither Caucasian nor Oriental, certainly not the heavy-boned native stock. I couldn't pin them down to any race. Her nose was straight, the nostrils neither wide nor narrow, but strong and firm. Her eyes were too wide-set and heavy-lidded to be Aryan, but they were not tilted; they were level. Her hair was not black, but chestnut and curled or naturally very wavy. Her glance was tawny and aflame with anger and excitement, furious upon the prostrate Barto. They were very light-colored eyes, and they caught the sun in a blaze that made them seem yellow.

Striking, she was a figure not of any ordinary kind. Her every aspect told that she came of a culture unknown to me. She was evidently not ignorant, but of a different way of life.

Looking into her eyes, appraising her interest in myself that had brought her back, drinking in the immense appeal of her strangeness and her evident gentility—the evidences of a past of cultivated living as strange as her attire—I forgot the unconscious man at my feet.

Her skin was whiter than my own! Her arms were bruised purple where Barto had clutched her. Then she spoke, in halting Korean:

"Is he dead?"

"No," I answered.

"Then he will live to meet a far worse fate! I know why you are here, stranger, and I warn you! You are on a fool's errand! The Golden Goddess is death for such as you!"

I was bewildered.

"What Golden Goddess?"

"The Golden Goddess whose symbol led him here. He does not know what it is. He stole it by murdering one of our own messengers for it. He did not *know* at all; he only heard the tales that some relate about her. They are

false tales."

"Did he tell you how he got it?"

"He was boasting to me, trying to get me to tell what I knew about her dwelling-place. I would not, that is why he hurt me."

"Why did you come back, whatever-your-name?"

"My name is Nokomee, and I came back to tell you something you need to know. Leave these others, and you will live! Stay with them, you will be slain with them. We do not allow such as he to come among us, golden girl or no."

"I cannot leave my comrades because of danger. What kind of man do you think me?"

"I do not care! I can only tell you. This is a secret place, where we remain hidden from the men of earth. I know what happens to those who stray upon our secrets! Go, and think no more to pry into treasure tales of this mountain land. It is not for such as you. Go, before it is too late. I cannot hold back the death from you."

I laughed. I thought of the Koreans who had deserted, of their talk about the fires at night, of demons and haunted mountains ahead.

"We came a long way on the track of Barto's tale of treasure from which he brought the golden girl. It will take more than words to frighten us away."

"Do not laugh! I try to save you from something even worse than death that can come to you. I want to return to you the favor that you did me. If you do not listen to me, how can I help you?" Her voice took on a plaintive, charming note; she smiled a half-smile of complete witchery.

A high, keening cry came suddenly from the slopes above us, and she raised on her toes as if to spring away.

"They come, my friends! I must leave you. I can only tell you to stay close by your fire at night. I cannot

say what fate will strike you. I cannot help you. Go back, friend who would live, go back!"

SHE turned and sprang lightly up the slope toward the sound of the cry, half human, half beast-like, that she had called "her friends." It had sounded to me like the cry of a wolf, or a cat-man, anything but human. But people can make odd sounds, and imitate beasts. Still it had been an eerie sound that gave me a foreboding, added to her warning words. What kind of people were these, who wore leather and jewels and used bows that might have come off an Assyrian wall painting?

Came a tumult above, the high clear blast of some horn, a dozen eerie cries hardly human—a rush and a pounding in the earth as though a party had ridden off on heavy, full-size horses. No Manchurian pony ever made such a sound on soft ground!

Polter and Noldi came back about an hour later. I had dragged the big Barto into a tent and made him comfortable. He was snoring peacefully. Polter squatted down beside me, folding his long form like a jackknife.

"That thing *was* a ship, Keele," he said. There was a husky excitement, repressed but still obvious about him. I grunted.

"It landed among some big timber on the south end of the mountain. We got pretty close, enough to see the sides of the thing. Men busy around it, we couldn't get too close, afraid they'd see us."

I started, a pulse of unreasoning fear, of terrific interest, ran through me. I asked in a voice I couldn't keep calm, "What kind of men, Hank? I saw reports of such ships in the papers, no one got close enough to see *that* much. Newspapers called them illusions!"

"They're not our kind of men; they are something very different. I don't know just how to tell you, besides I couldn't be sure. But they seem to be a people—" He stopped. "I'd rather you'd see it yourself. You wouldn't believe me."

Noldi came out of the tent where Barto was still snoring. He came over and squatted across the fire, eyeing me strangely.

"What happened to the big jerk, Carl?" he asked, a little tremor of anger in his voice.

"I've got to tell you fellows we're in trouble," I began. I did not believe that the girl's people would ignore Jake's attack upon her.

Hank looked at the slender man from New York's East Side. "What's the matter with Barto?"

"S'got a bruise on his jaw the size of a goose-egg. Like a mule kicked him. Scratched up quite a bit. I just wondered. He's unconscious, too; I couldn't wake him up."

"We may be in for it," I went on. "When I got back to camp, Hank had a girl. He'd thrown her down, was struggling with her. I had to put him asleep to stop it. Didn't want trouble with her people."

Noldi glanced at the torn place in the soft sod where the scuffle had taken place. I had unconsciously nodded toward it. He got up, walked over, picked something out of the grass.

"Some girl, wearing this kind of stuff!"

He handed the glittering bauble to Polter. It was a necklace of emeralds, with a pendant of gold in which was set a big blue stone that I couldn't recognize, maybe a diamond, maybe something else. It looked almighty valuable, each stone was as big as a man's thumbnail. It had snapped, lain there unnoticed by either of us.

NOLDI looked at me a little venomously.

"Looks as if you were a little premature, letting her go. We should have found out where she gets this kind of sparkle first!"

"Seemed the safest thing to do. We are only four, how could we handle her friends?"

"Bah, they wouldn't have known where she was. We could have kept her till we were good and ready to let her go."

I stood up, took out my pipe and filled it.

"What about this ship you saw, and the people around it. That's important, not this girl and her jewelry."

"We couldn't see much except that it was a ship and that it landed in the trees where it couldn't be seen from the sky. It's pretty big, and there are men moving around it. That's all."

"That's plenty! If we run into them, there is no knowing what they'll do. That ship was never built on this planet."

Noldi didn't smile or laugh. He just looked at me. Serious, puzzled, and a little scared.

"You think it's a space ship, eh, Keele?"

I nodded.

"What else could it be?"

"What's it doin' out here in no man's land?" Polter asked. "You'd think strangers like that would land near a city, try to make some kind of official contact."

"If you were landing on a strange world, would you land near a city?" I asked.

Polter laughed.

"I guess you hit it. They don't know whether they'd be welcome or not. Scared, eh?"

"Just careful, I'd say. We don't know anything about them. But ships

like that have been reported off and on for hundreds of years. Don't be surprised if you never see a trace of it again, and if no one else but me ever believes you when you mention it. I don't think we'll have to worry about the flying saucer."

"What the hell do they want, then?" Noldi didn't know what I meant, exactly.

"Nobody knows, Frans. Nobody ever saw them as close as you just did today."

* * *

WATCHING Jake Barto next morning, I saw that the little image in his hand pointed right across the center of that cloud-topping mountain. That meant we had to go around it, for we were not equipped for such climbing, nor would there have been any sense in it. Jake figured on circling to the left, and I was glad, for I for one wanted no parts of that disk ship that Polter and Noldi had seen in the other direction. Jake ignored me. He was unpredictable!

It was a long mountain, and we traveled along one side, toward the north, figuring on crossing to the east whenever a pass appeared. After a time a faint trail showed, and we followed it. It drew us higher, until we were moving perilously along a ledge of rock, with precipitous walls above and a sharp drop below. Higher and higher, above the tree-line now, the path went on, and there were signs of travel along it that worried me.

Polter was in the lead, and as we rounded a shoulder of rock, gave a cry of wonder. We hurried after, to see the trail breaking over a low crest of the mountain, and leading now downward. This shoulder of rock outthrust here marked the place where the trail we were following crossed the ridge of the mountain crest at its lowest point.

But it also marked something else, which was what had caused Polter's cry.

A line of dust across the trail and along the near-bare rocks stirred and lifted and fell fitfully, as if the air was barred passage by some invisible wall, and there were the skeletons of birds that had flung themselves against the invisible wall and died, falling there. There was the skeleton of a goat half across the trail; and at one side, what had once been a man! All these dead—and the bones could be seen here and there along the far line of the dust—had gone so far and no farther. Polter had stopped fearfully ten feet from the clearly marked line—and I for one had no desire to add my skeleton to the others.

For a few minutes none of us had anything to say, then reason reasserted itself, and I pressed past Polter, knowing that the thing was an illusion born of coincidence and wind currents. Some baffling current of wind around the mountain formed here a wall of air cleavage, and the skeletons were merely coincidence. I pushed up to the strange line of lifting and falling dust, a little roll showing the magic of invisible force, and pressed on, as if to cross.

Behind me a cry gave me pause. I turned, looking for that cry's source, for it seemed to me the cry was the girl I had rescued from Barto. That saved me, for the little horse behind me pressed on across the strange line—and faltered, gave a horse-scream of terror, fell dead before me.

We stopped, terror of the unknown in our breasts, wondering—afraid to put the wonder into words. We did not look at each other or discuss the thing, we just accepted it, and stared dumbly at it like animals. I tossed a rock across the body of the now quite motionless pack animal, the rock reached the wall

beneath which my animal lay dead—slowed, curved sharply to the ground, did not roll, but lay as if imprisoned in invisible jelly!

There was a wall of invisible and deadly force there, and there was no known explanation for it!

I growled at Barto, all the suspicion and distrust that had been building up in me toward him in my voice.

"What does your golden girl tell you now, Jake?"

JAKE surprised me. He walked ahead toward that frightening manifestation of the unknown, holding the little statuette before him like a sword, his ugly face rapt in some listening beyond me. As the little statue crossed the line, he sang out:

"Listen, Goddess of the Golden forces, listen and heed! We come from afar to pay our worship, to give to you our devotion, and we are met with this wall of death! Is that the way you greet your friends?"

Jake waved the statuette in a circular motion, then crossed the circle twice with the waving gold. He stood there, his crossed eyes darting here and there along the line of force, and after a long minute, after a time that seemed filled with a distant chuckling, like thunder too far off to be heard clearly—the lift and fall of the dust on the baffled wind stopped, the strict line of the wind's stoppage began to disappear, the line of demarcation was gone!

Jake reached out an arm, feeling cautiously for the invisible wall, and after a minute, his face lightened from its habitual gloom, he stepped across the line, and did not stagger and fall as had the horse. The wall was gone! Jake turned, said calmly:

"Come on, our friends have decided to let us in."

My mind in a whirl at the unex-

pected display of knowledge beyond me, of forces beyond the power of any rifle bullet to overcome, of strange hidden things here—I stepped across the line, keeping close to the tracks left by Jake's big feet. Polter and Noldi followed and the horses plodded after. We trudged on, but not the same. We were afraid, and we were conscious of a vast ignorance, of a fear that we did not belong here, that the only wise thing for us to do was to turn back and give up this Jake Barto and his cross eyes and his mumbo jumbo statue to his own doom.

At least that's the way I felt, but something stronger than curiosity drew me on. I wanted to know why I was so drawn when reason kept demanding I give up this quest. I wanted to know why a golden statue pointed always to one point on the horizon, and why that wall of force had obeyed Jake's injunction to go away. Or was I unable to think, really? Was I shocked out of my ability to reason and act on my reason's dictates?

Ahead, as the trail dipped low, a vast panorama of valley and hill and hollow, of eerie rocky spires, lay outspread. Here and there were cultivated fields, and figures at work on the fields. In the distance shone a stream. It flowed meandering into a wide lake. There were two villages, not clear in the haze. At the distant lake, some kind of larger structure lifted tall towers, shining with prismatic glitter, a city of strange appearance.

We had crossed a barrier, and we had entered a land of the living—but it was unclear before us. The drifting mountain mists, the sun-glitter and the haze of noon kept the scene from striking through to our brains with its true significance. For there was an eerie *difference* about the scene; it was not a land below us such as any of us had

ever seen. I felt that and yet I could not think clearly about it. We moved along like zombies, not thinking—just accepting the unusual and the unknown as casually as if we were travelers who could not be astounded. But inside, my mind was busily turning the significance and the meaning of this wall of force. I had heard of such walls before—upon Shasta in California, and in Tibet, and in ancient times in Ireland, and there were other instances of a similar wall in the past, and in the present in other places. But what it could really mean, that was what I did not know.

After crossing that invisible barrier, things began to happen in a sequence, of a strangeness and with a rapidity such that I was unable to analyze or to rationalize. From there on I was like a man on a tightrope, hounded by invisible tormentors trying to shake me off. I had not time to wonder whether it was true that spirits existed. What I did think was that some of these Korean primitives had a Devil Doctor who surpassed all others in trickiness, and was amusing himself at our expense. But I did not *think* it, I *clung* to the idea to save my reason from tottering over the brink.

The first thing after the wall that could not exist but did—after we had passed on over the ridge and half way down the mountain side—was a gully along the mountain side, up which Barto turned. I assumed he was still following the pointing of the magnetic statuette, but I was vaguely conscious that none of us were *really* conscious—were under a kind of spell in which our actions and our thoughts were predetermined—inevitable! I knew it, but I could not shake it off, nor put my finger on any reason why I should shake it off and call a halt to the strange, wordless, silent following of Jake and his eerie talisman.

THE faint trail led along the bottom of the gully, and after twenty minutes of downward progress, led into a dark overhang of rock, the sky hardly visible where the rocks almost met overhead. Down the semi-cavern we went; still silent, zombie-like; and I felt ever more strongly the compulsion that made us so move and so unable to do otherwise.

Jake was striding rapidly now, his dark ugly face aflame with weird eagerness, my own heart pounding with alarm at the strangeness and the irrationality of the whole proceeding. He held the statuette out stiffly, it seemed fairly to leap in his hands, as if tugging with an ecstatic longing to reach the dark place ahead. The rocks closed completely overhead; the dimness changed to stygian darkness. I got out my flashlight, sent the beam ahead. But Jake was pressing on through the darkness, directly in the center of the trail.

Quite suddenly the cavern turned, opened ahead, wider and wider—and before us lay a room of jeweled splendor, the temple of some forgotten—*or was it forgotten?*—cult of worship.

The golden statue in the center of the big round chamber drew our eyes from the splendor of the peculiarly decorated walls, from the strange crystal pillar on the tall dais at the far wall, from the weird assemblages of crystals and metals that had an eerie resemblance to machines—to a science entirely unknown to modern men. All these details of that chamber I remember now, looking back, but then—my attention and that of the others was entirely drawn to the beauty of the tall, golden woman who stood in frozen metallic wonder at the center of the forgotten crypt.

Jake, his ugly face in a transport, had fallen to his knees, was crawling forward to the statue abjectly, mouth-

ing phrases of worship and self-abnegation. Close on his heels came Polter and Noldi, eyes rapt, movements mechanical. I stopped, some last remnant of sense remaining in my head, and by a strong effort of will held my limbs motionless.

As Jake reached the statue, the little golden replica of the life-sized woman of gold seemed to leap out of his reaching hands, and clung against the metallic waist of the golden woman as a lodestone to the mother lode.

Even as Barto's hands touched the statue, he slumped, lay there outstretched, his fingertips touching the metal hem of the golden skirt; and whether he was unconscious from unsupportable ecstasy or for what mad reason, I did not know, but I did not *want* to know.

Undeterred by Jake's condition, the two men following in his steps also reached out hands to touch the golden metal—and fell flat on their faces beside Jake Barto, unconscious, or dead!

I stood, numb and with a terrific compulsion running through my nerves, which I resisted with all my will. I drew my eyes from the strangely pleasant magnetic lure of the metal woman with an effort and examined that strange chamber.

The walls were covered with a crystalline glittering substance, like molten glass sprayed on and allowed to harden. Behind this glasseous protective surface, paintings and carvings spread a fantasy of strange form and color, but the light was too dim to make much of it, except that it was alien to my experience, and exceedingly well done, speaking of a culture second to none.

Beyond the central form of the strange golden statue, was the dais which I had noticed at once, and now my eyes picked out the fact that on it was also a glasseous protective sheath

about a form—another statue, I thought.

THOUGHTFULLY I prowled along the rim of the room, examining the wall frescoes foot by foot, seeing on them a strange depiction of semi-human forms, of crab-men and crab-women, of snake-men and snake-women, of men half-goat and half-man, of creatures hardly human with great jaws that looked like rock-cutters, with hands like moles on short powerful arms, fish people with finned legs and arms, their hands engaged in catching great fish and placing them in nets, a nightmare of weird half-human shapes that gradually brought to me a message that I could not accept.

If that rock painting was telling a true story and not some allegorical fantasy—these people who had built this place had been a race who knew the secrets of life so intimately they could manipulate the unborn child into shapes intended to give it powers and physical attributes fitting it for amphibious life, for the underground boring life of a mole, for the tending of flocks in the goat-legged men—the whole gamut of these monstrous diversions from the normal human seemed to me designed—purposely—to build a race which, like ants, has a shape fitted to its trade.

I threw off the illusion of a deformed past race the wall art gave me, and passed on to examine the crystalline pillar on the dais. I stood a long time, before the dais, drinking in the beauty of the form locked within the prisoning glass.

No human, no earth woman—she was different from anything I had ever even imagined.

Female, vaguely human in form she was, with an unearthly beauty; but four-armed, with a forehead that went up and up and ended in a single tall

horn, as on the fabled unicorn.

Her eyes were closed, if she had eyes beneath the heavy purple-veined lids, so like the petals of some night-flower, pungent with perfume.

Naked the figure was, except for a belt of what looked iron chain around the waist, black and corroded with time, holding her with a great bolt and link to the side of that crystalline prison.

Her hair, black as night, was pressed tight to the skull by the pressure of the crystal, which must have been poured about her in a molten or liquid state.

As I stood there agaze at the strangeness and wonder of her, a voice at my shoulder made me whirl in surprise. A soft, silky familiar voice:

"Do you find the dead Goddess so fascinating, stranger from the world of men?"

It was the girl of the forest, no longer in hunting garb, but dressed in Turkish trousers, vest and slippers with upturned toes. Jewels glittered about her waist and neck and arms, her wrists jangled with heavy bangles, in her ears two great pendants swayed—her eyelids were darkened and her lips reddened. She was a ravishing houri of the harem, and I gasped a little at the change.

"Have you put on such clothes for my benefit?" I asked, for I really thought perhaps she had.

She frowned and stamped her foot in sudden anger.

"I come here to save you from what has happened to your friends, and you insult me. Don't you want to live? Do you want to become what they are going to become?" She pointed to the bodies of Jake and Noldi and Polter.

I TURNED where she pointed, to see a thing that very nearly made me scream out in revulsion.

I shuddered, shrank back; for several creatures were bending over the three, lifting them, bearing them away.

It was the strange, revolting difference from men in them that caused my fear. Once they may have been men, their far-off ancestors, perhaps—or in some other more recent way their bodies had been transformed, made over into creatures not human, not beast, not ghoul. What they were was not thinkable or acceptable by me. I turned my face away, shuddering.

They were men such as the wall-paintings pictured, something that had been made from the main stock of mankind, changed unthinkably into a creature who bore his tools of his trade in his own bone and flesh. Mole-men, men with short heavy arms and wide-clawed hands, made for digging through hard earth. They bore my friends away on their hairy-naked shoulders, and I stood too shocked to say a word. Three mole-men, accompanied by three tall, pale-white figures, figures inexpressibly alien—even through the heavy white robes—that moved with an odd hopping step that no human limb could manage, turned their paper-white, long, expressionless faces toward me for an instant, then were gone, on the trail of the mole-man. Beneath those robes must have been a body as attenuated as a skeleton, as different as an insect's from man's. Within those odd egg-shaped heads must have been a mind as alien to mine as an ant's mind.

"Why do your people take my companions?" I managed, when I had regained my composure.

"They are not my people; they are of the enemies of the Dead Goddess." The girl gestured to the figure in the crystal pillar. "My people have no time for them, but neither have we power over them. They go their way, and we go ours. Once, long ago, it was

different, but time has made us a people divided."

"What will become of the three men?"

"They will become workmen of one kind or another. Everyone works, in *their* life-way. But it is not *our* way! They guard our land from such intruders; we let them. It is an ancient pact we have with them."

"Why did they not seize me, I am an intruder as much as the others?"

"Because I signed to them to let you stay. You did not see, whatever-your-name-is . . ."

"Call me Carlin Keele, Carl for short. What is your name, and what is your race, and why are you so different from people as I know them?"

"My name is Nokomee, as I told you before. You are still confused from the magic that led you here. I have saved you once, and *now we are even*; my debt to you is paid. You will never see your friends again, and if you do, you will be sorry that you saw them, for they will have become beasts of burden. Now go, before it is too late. This is not your kind of country."

Something in her eyes, something in the sharp peremptory tone she used, told me the truth.

"You don't really want me to go, Nokomee. I don't want to go. Many things make me want to stay—your beauty is not the least attraction. I could learn so much that my people do not know, that yours seem to know."

"I would not want my beauty to lead you to your death." Nokomee did not smile, she only looked at me, and I saw there a deep loneliness, a tender need for companionship and sympathy that had never been filled in her life. She looked at me, and her lower lip trembled a little, her eyes suddenly averted from mine.

"Nokomee, there is so much we

would have to tell each other, you of your life, and I of the great country of which you have never heard. Would you not like to see the great cities of my country?"

She shook her head, turned on me with sudden fierce words:

"When you came and struck down that hideous cross-eyed man, my heart went out to you in gratitude. Go, while my heart remains soft, it is not so often that the heart of a *Zerv* is soft toward any outlander. Go, I cannot protect you from this place."

"I will stay," I said.

"Stubborn fool!" She stamped her foot prettily, imperiously, vexed at my refusal to go out of that weird place the way I had entered. "Stay then, but do not expect me to keep off the slaves of the Goddess. This place can be most evil to those who do not know what it is, nor why it is secret."

SHE turned, walked behind the great dais of the crystal sarcophagus, and I followed just in time to see her disappear behind a hanging curtain of leather. I hastened after, my hand on my gun, for I had no wish to be left alone where I had seen my three companions stricken down with no enemy in sight.

Behind the curtain a passage led, along the passage were several doors. She sped past these lightly, almost running. I followed, she must have heard me, but she did not look back. The doors along the passage were curtained. Through the gaps of the curtain I could see they were empty of life. The curtains were rotted as if long unused, dirty and blotched with mould staining the leather.

Though she had spoken to me in Korean, and I had answered in the same tongue, I knew she was no native, for she spoke it differently, per-

haps no better than myself. I was no judge; what she used may have been a dialect different from that I had heard previously.

I followed as she emerged from the long tunnel into the blaze of sunlight. She stood for a moment letting her eyes adjust to the glare. I stumbled to her side, half-blinded, stood looking down at the scene which seemed to engross her.

Gradually it came clear, like a television screen coming into perfect tune—the immense inner valley that the mountain of cloud-like snow enclosed. In the center of the encircled valley a lake shimmered blue as the sky, and about that lake was a city.

My eyes refused, at first, to accept what they were seeing. My mind rebelled, but after a minute of staring and making sure—I gasped.

Alien to this earth it was, but beautiful! Towers, and round-based dwellings braced together in one single unit of structural strength, a designed whole such as our architects dream of and never achieve. Walled with white marble, the city was a fortress, but a lovely fortress. Yet there was a coldness, an angularity, that told me these Zervs, as Nokomee had called her race, lacked true sympathy for life forms, lacked emotion as we know it in art. Yet it was beautiful, if repellent because so alien, so pure in design, so lacking in the sympathetic understanding of man's nature. This was a city no earthman could ever call home. It lacked something. There were no dogs, no strolling women or running children, it lay silent and waiting—for what?

Nokomee waved a hand.

"Titanis, our first earth colony. But it is no longer ours. The Schrees have taken it from us. That is why it is silent."

I did not understand. There were

plodding lines of people, disciplined, carrying burdens, no bigger than ants at this distance. There was an ominous horror about the quiet beauty of the place. It was somehow like a beautiful woman lying just slain. Yet I could see no wounds of war, no reason for the feeling that I had, like the sudden shrinking one might have at sight of the stump of a man's arm just amputated.

I looked into Nokomee's face, and there were tears in her eyes. My heart sank. I felt a vast sympathy for her sorrow, though I could not understand.

"We planned so much with our new freedom here in your wilderness. Then came the raiders, to freeze our Queen in her sleep, to drive us into your forests, to make of us that remained mindless slaves and maimed horrors. I cannot bear it, stranger. I cannot . . ."

She turned and wept, her head on my chest. I patted her head, feeling entirely incompetent to console her for what injuries I could not imagine.

"What raiders, Nokomee? Tell me. Perhaps there is a way I can help. Who knows?"

"We are so few now, who were so many and so strong—and every day fewer. There is no hope. Do not try to wake it in me. It would be madness."

"Tell me. Perhaps that alone would help you."

"How can I tell you the long history of my home world, the immortal wisdom of our Queen, the strange science her immortal family gave her, of how we fought to protect her from our own tyrants and at last fled into space with her? How can I tell you of what she is? How could you understand the ages of struggle on our own world that reduced her kind to but a dozen, and left our kind, the mortals, at the mercy of the Schrees? You ask, but it is im-

possible for you to believe things you do not know about."

"Perhaps if I told you of my people and their life, you would understand that I could understand what you think is impossible for me. I am not ignorant as the others of earth people you have met. And my nation is numerous, the greatest of this earth."

"Our ways are too strange to you. But I will try. You need not try to tell me of your people; we examined your earth carefully before we chose this valley for our retreat. Here we built and raised the force wall to keep out inquiring interlopers like yourself who might bring the powers of your nation in ignorant war against us. But from our home world the Schrees were sent on our trail, and they found us. They were too many. Our only hope was in safe hiding, and they found us out. We did not know they could find us, or we would never have built. We thought pursuit had long been abandoned, but they are driven by single-minded hate, not by logic. It has been a lifetime of wandering they have followed us. It has been all my lifetime, making this home here, thinking ourselves safe—and then they came and destroyed all our work."

AS SHE talked, she had quieted. We had resumed walking along the ledge of the mountainside. Suddenly from ahead a man leaped out, his strange weapon trained on my breast. I stood, not daring to move, while Nokomee shouted a string of shrill alien syllables at him. He thrust the weapon back in his belt, and fell in behind us as we passed. I could not help staring at him, and at the thing he had pointed at me.

It was a tapering tube about a foot long, triggered on the thumb side with a projecting stud, with a hand-grip

shaped with finger grooves. I knew it was a weapon with a long history of development behind it by the simplicity of the lines, the entire efficiency of its appearance. The small end was a half-inch, perhaps, in bore, the big end perhaps three inches or less. He handled it as though it weighed but a trifle. I did not ask what it was.

The man himself was no taller than Nokomee, though much more solidly built, with thick, slightly bowed legs and heavy black brows on bulging bone structure, his eyes deep-set beneath. His ears, like Nokomee's, were high and too small to be natural. His teeth were larger than normal on earth, and the incisors smaller and more pointed, the canines heavier and longer. There was a point to his chin, heavy-angled and thick-boned as it was, it was not an earthman's chin. His neck was long, more supple and active, he kept moving his head in an unnatural watchfulness like a wild animal's. I wondered what other differences, small in themselves, but adding up to complete strangeness of aspect, I would find in time.

"That is Holaf," murmured Nokomee in Korean to me. "He is a chief among us now, since the fall of our strength. He is good, but young and always too impetuous. He needs long experience, and it looks as if he would get it, now."

"You have more than one leader?" I asked.

"We have three chiefs left to us, who rule their families—their clans. We have but one real leader. He is an old wise man left us by good fortune. He is our lone scientist. The chiefs of the clans listen to the leader, but they argue. Things look bad for us all."

"You are too few to reconquer the city?"

"Too few, yes. And time plays against us, for with the coming of the

ships from our home planet—that I should call that tyrant's nest home!—there will be even more of the Schrees, then. We are a lost people now. There is no hope, eventually we will be hunted down as you earthmen will be hunted down, like animals. Made into slaves—and worse than slaves. You will learn what I mean when next you see your three friends.

It was too much for me. I asked:

"Why don't you leave this place, and go on to another?"

"On your little world? It is not big enough to hide ourselves from them. And we have lost our ships, we cannot get others."

"You think that they mean to conquer our whole planet?"

"In time they will do so. Not yet, but when they are many, they will spread, slaughter all who fight them, and enslave all who do not. They are very terrible creatures, not men at all, you know."

"Not like you and I?"

"Not at all. You will see, soon. Hurry, it is late, and we have council to attend."

There was a deep passion in her words, quick and sharp and strange on her lips as they were, a passion of anger and hopeless effort that somehow roused me into desire to help her and these strange people of hers. Too, if what she said was true, these raiders who had despoiled her people would in time engulf the world with a war of conquest, even if they were less able to defeat us than she estimated. I resolved to make the most of this opportunity to learn the worst of this hidden threat to men everywhere. I felt a kinship with Nokomee and her friend, silent and alert beside me, and I realized it could well be that I had in my hands the future of mankind, and that it behooved me not to let it fall through

carelessness.

LAPSED now into silence, we reached the end of the trail along the ledge. We came out upon a broad shelf, with several cave mouths opening along its cliff-side. Gathered here in the twilight were some two-score men and women, bearing weapons; some the short powerful bow I had seen in Nokomee's hands; others weapons like Holaf's tapered tube; still others bearing small, round metal shields embossed with weird designs that meant nothing to me. Squatted here, without fire, they fell silent at our approach, eyeing me with curiosity and the beginnings of anger at my intrusion. Nokomee began to talk swiftly in that rattling, high-pitched tongue of theirs. I squatted down on my heels, took out my pipe, lit it. At the flare of my match Holaf struck it from my hand. I realized it had been a blunder, even a spark might attract attention to their presence on the hillside. Still, the incident told me Nokomee had not been lying to me.

Holaf pointed at the city far below, now glowing here and there with lights, and at the match on the ground. Then he motioned to a cave mouth, and I followed him. Inside there was a fire burning, furs strewn about the floor, metal urns and even mirrors hung on the rough stone walls. I sat on a rude wooden bench of newly-hewed wood, lit my pipe again without interference. But I was sorry to miss that conference outside in the open air. I wanted to hear, even if I could not understand. Holaf still remained by my side, and his hand did not leave the oddly-carved butt of the tapered tube-gun.

I sat there, feeling very much alone, with Holaf watching me somberly, the only light a flickering amber from the fire. I started to my feet as a musically

pitched, almost singing voice questioned Holaf in their tongue. I looked about for the source, then saw her moving toward me in the half-light, and I stepped back in a kind of awe and embarrassment, for this was new.

She was as tall as myself, shaped with slender Amazonian strength, but curved and soft and subtly aware of her feminine allure, strongly interested and pleased at the awe and pleasure in my face. Her, rounded, fully adult body was sketched over with a web of silkily gleaming black net, light and unsubstantial as a dream, clinging and wholly revealing. Her eyes were dark-lidded and wide-set, her brow high and proud, and about her neck hung a web of emeralds set in a golden mesh of yielding links.

She came on, moving on shoes like Japanese water shoes, completely mystifying as to how she balanced on the stilt-like soles. Stepping thus in little balancing steps like a dancer, she moved very close, peering into my eyes, so that I blushed deeply at the nearness and the nudity of her, and she laughed, amusedly, as at a child. Her long, gemmed hand reached out and touched me, and she talked to Holaf excitedly, her face all smiles and interest; I was a wholly fascinating new toy he had brought her, it seemed. Then she sank to the bench, crossing her lovely knees over her hands, clasped together as if to make sure they behaved. To me she was wholly cultured and I some strange boor who had never been in a drawing room. I felt the impact of that culture in her interested eyes and in the sleek, smart bearing of her utterly relaxed body. She stretched a hand to gesture me to be seated, and I tried Korean on her.

"It is a pleasure to meet you, lady. If I but knew who you were, and how to speak properly, there is much we

could find of interest to discuss."

"I am sure of it, stranger. First you must tell me of yourself, and then later we will talk of what is familiar to me. I cannot put off the curiosity which burns me. Please tell me all about your people and yourself!" Her voice was hard to follow, she handled the clumsy Korean with a bird-like quickness and an utter disregard for the nature of the language. Her eyes burned into my own, and I sat embarrassed beside her, tongue-tied, while Holaf smiled quietly and kept his hand on his weapon.

So I talked about New York, about my home town in Indiana, about my mine in South America, about anything and everything, and she listened, rapt eyes encouraging me, hanging on every stumbling, mispronounced, difficult word. I would have given an arm to have been able to talk expertly in her own tongue.

Thus engaged, and engrossed by her, I glanced up absently to note Nokomee's eyes blazing into my own in fury, and spaced about the room in a listening circle, a score of others. I stopped abruptly, and Nokomee lashed out at the woman beside me with a string of alien expletives that made her face flame with an anger as great as Nokomee's own. I wondered vaguely what I had done . . .

Their strange, grim faces, all watching me, seeming to peer inside me, trying to gauge me as an enemy or a friend. I stood up, for the exciting near-nude body of the woman who had caused Nokomee's outburst was too close, too intimately relaxed.

Abruptly Nokomee took me by the hand, led me out and along the ledge on the cliff. Into another cavern entrance she led me, to a smaller chamber, where another fire burned, and another bench invited to its warmth. She half pushed me to a seat, and busied herself

in the next adjoining chamber, rattling dishware, and now and again giving a sharp exclamation as of extreme disgust.

I GATHERED I had been guilty of falling for the Zerv equivalent of a vamp. How wrong I was in this deduction I was to learn. It was not the woman's beauty that Nokomee feared, but something vastly more dangerous. I was very ignorant then. The Zervs were an ancient people and their ways were strange entirely. For the net-clad beauty had been a "Zoorph." I asked Nokomee, as she repeated the word again.

"What is a Zoorph, that makes you so angry? I thought she was very charming. I saw no harm in talking to her!"

Nokomee thrust her head out of the curtained doorway, from which the smell of food told me I had not eaten since morning.

"A Zoorph dear *child* of earth, is a creature not good for man or beast! Only a Zerv would be fool enough to keep so dangerous an animal about! If I told you, you would not believe it."

"Tell me anyway, Nokomee."

The girl came, bearing food on a tray. She squatted at my feet, putting the tray on the bench, and holding a large graceful urn of some liquid to replenish my cup. Very prettily she did this, yet I gathered that it was something which would have overwhelmed me with the honor if I had understood. I did appreciate her service, and I tried to say so, but she silenced me.

"Never mind, one day you will understand how proud we are, that in our own world and in our own society *you* would be less than a worm. Yet I serve you, who am more above you than a princess would be in your world. Thus

does the world change about one, and one adjusts. But do not think of it. It must be, or some terrible thing like the Zoorph would seize upon you here among us."

I laughed a little, for I was sure she was telling a lie, to warn me against the "vamp" in the only words she could think of in the alien tongue.

Her face flushed deep red at my laughter, and she half rose as if to leave, but restrained her anger.

"A Zoorph is worse than a disease, it has enervated my people until they have lost everything, and still they are among us. They are children raised by a secret cult on my own world, trained into strange practices. It is somewhat like a witch or sorcerer would be to you, but much, much different. You could not understand unless you were raised among us. When men are tired of life, they go to a Zoorph. It is not nice to speak of, what they are and what they do. To us, it is like death, only worse. Yet we have them, as ants have pets, as dogs have lice, as your people have disease. It is a custom. It is a kind of escape from life and life's dullness—but it is escape into madness, for the Zoorph has an art that it utter degradation, and few realize how bad they are for us. You must never go near her again!"

DAYS passed into weeks, and every day I learned a few words of the Zerv language, every day I picked up a little more insight into their utterly different ways and customs and standards—their scale of values. It was a process replete with surprises, with revelations, with new understanding of nature itself as seen through the alien eyes.

I remained as a kind of semi-prisoner, tolerated because of Nokomee's position and her affection for me.

Nokomee, I learned, was "of the blood," though there were few surviving of her family to carry on the power and prestige she would have inherited. Yet, she was "of the blood" and entitled to all the respect and obedience the Zervs gave even to their old ruler.

He was an attenuated skeleton of a man, with weary eyes and trembling hands, and I grew more and more sure that the inactivity against their usurpers visible in the valley beneath was due more to his age and timorous nature than to any inability to turn the tables. They seemed to hold the "Schrees" in contempt, yet never took any action against them, so that I wondered if the contempt were justified or was an inherited, sublimated hatred.

The supplies, rifles and ammunition which had been left on our horses when we entered the cavern of the golden image, had been brought to Nokomee's cavern and locked in a small chamber before my eyes. It was all there. As the time dragged on, I chafed at the inactivity, fought against the barriers of language and alien custom that separated me from these people, struggled to overcome their indifference and their, to me, impossible waiting for *what* I did not understand.

Finally I could wait no longer. In the night, I burst the lock of the closet with a bar, took out a rifle and .45 and two belts of cartridges. I slid over the lip of the ledge that hid us from the city's eyes. I was going to see for myself what we were hiding from, what we were waiting for, was going to take my chances with the dangers in that place they had built and from which they now hid. I had pressed Nokomee for explanations and promises of future participation in their life and activities, and I had been refused for the last time! Like a runaway, I slid down the steep cliff face, putting as much space

between the Zervs and myself as rapidly as I could.

The night was dark as pitch. I had left Nokomee asleep in her chamber. I had avoided Holaf, who still kept a kind of amused watch over my activities, and I was free. Free to explore that weird city of plodding lives, of strange unexplained sounds, of ominously hidden activity!

Scrambling, sliding, worrying in the dimness, I finally reached the less precipitous slopes of the base of the cliff. As I stopped to get a bearing on the direction of the city, above me came a slithering, a soft feminine exclamation, and down upon me came a perfumed weight, knocking me sprawling in the grass.

My eyes quickly adjusted, I crawled to the dim shape struggling to her feet. Her face was not Nokomee's, as I had at first thought. Those enormous shadowed eyes, that thin lovely nose, the flower-fragile lips, the mysterious allure—were the woman whom Nokomee had described as a "Zoorph" and whom she had both feared and despised. I spoke sharply in the tongue of the Zervs. I had learned enough under Nokomee's tutelage to carry on a conversation.

"Why do you follow me, Zoorph?"

"Because I am weary of being cooped up with those who do not trust me, just as you. I want to find a new, exciting thing; just as do you. Even if it is death or worse, I want it. I am alive, as are you."

I put down the dislike and distrust the girl Nokomee had aroused in me against her. Perhaps she *had* been merely jealous of her.

"Don't you *know* what could happen in the city?" To me it was curious that she should want to go where the others feared to go.

"I know no better than you what

awaits there, and I do not believe what they have told me of the Schrees. They are not wholly human, but neither are they evil wholly, as the Zervs suppose."

"Why do the Zervs wait, instead of trying to do something for themselves? They speak of the threat of these raiders, yet they do not try to help me bring others of my people here to stop the threat they speak of so fearfully. I do not understand."

"The old ruler thinks the ships will come and drive them off from his city. But he is wrong, they will never come. It is like waiting for the moon to fall. The raiders' ships will return, and they will be stronger than ever. But not a ship of the Zervs remains in neighboring space to succor us. Yet he hopes, and his followers wait. It is foolish, and he cannot trust you or men like you to get help for him. He is too old to meet new conditions and to understand."

FEW of the Zervs had shown the rapt interest in me and my people that this Zoorph had made so plain. I thought backward on how carefully she and I had been kept apart since our first meeting, and I realized there was more to it than Nokomee's words of anger.

"What is a Zoorph, and what is your name? Why did Nokomee warn me against all Zoorphs?"

"A Zoorph is a member of a cult; a student of mysteries not understood by the many. The others have a superstition about us, that we destroy souls and make others slaves to our will. It is stupid, but it is like all superstitions—hard to disprove because so vague in nature." She flickered impossible eyelashes at me languishingly, in perfect coquetry. "You don't think me dangerous to your soul, do you?"

I didn't. I thought her a very charm-

ing and talented woman, whom I wanted to know much better. I said so, and she laughed.

"You are wiser than I thought, to see through their lies. They are good people, but like all people everywhere, they have their little insanities, their beliefs and their intolerances."

Yet within me there was a little warning shudder borne of the strange power of her eyes on my own, of the chill of the night, of many little past-observed strangenesses in her ways, in the fear the Zervs bore for her . . . I reserved something of caution. She saw this in my eyes and smiled sadly, and that sad and understanding smile was perfectly calculated to dispel my last doubt of her. I slid closer across the grass, to lie beside her.

"What could I gain by a knowledge of what lies in the city, Zoorph?" I asked.

"My name is *Carna*, stranger. In that city you can learn whether there is danger for your people in what the Schrees plan on earth. We could not tell that, for we do not know enough about your own race's abilities. You could steal a vehicle to take you to your own rich cities. And as for me, I could go with you, to practice my arts in your cities and become rich and famous."

"What are your arts, Carna?"

"Nothing you would call spectacular, perhaps. I can read thought, I can foretell the future, and I can sometimes make things happen fortunately, if I try very hard. Such things, very unsubstantial arts, not like your gun which kills. Subtle things, like making men fall in love with me, perhaps."

She laughed into my eyes and I got abruptly to my feet. She was telling the truth in the last sentence, and I did not blame Nokomee for fearing her power.

"Let us see, then, Carna, what the

night can give us. I cannot wait forever for chance to bring me freedom. Come," I bent and helped her to her feet, very pleasant and clinging her grasp on my arm, very soft and utterly smooth the flesh of her arm in my hand, very graceful and lovely her swift movement to rise. My heart was beating wildly, she was a kind I understood, but could not resist any the better for knowing. Or was I unkind, and she but starved for kindness and human sympathy, so long among a people who disliked and feared her?

We walked along in the darkness, the distant moving lights of that city closer each step, and a dread in my breast at what I would find there, a dread that grew. Beside me Carna was silent, her face lovely and glowing in the night, her step graceful as a deer's.

We circled the high wall of white marble keeping some twenty feet away, where the grass gave knee-high cover we could drop into instantly. We came around to the far side from the cliff, and stopped where a paved highway ran smooth, like pebbled glass, straight across the valley. I glanced at Carna, she gestured toward the open gate in the wall, and smiled a daring word.

"In. . .?"

"In!" I answered, and like two kids, hand in hand, we stole through the shadowed gateway, sliding quickly out of the light, standing with our backs to the wall, looking up the long, dim-lit way along which a myriad dark doorways told of life. But it was seemingly deserted. Carna whispered softly:

"When it was ours, the night was gay with life and love, now—it is *death!*"

"Death or taxes, we're going to take a look."

We stole along the shadowed side of the street, the moon was up, shedding much too bright a light now for comfort. Perhaps a hundred yards along

that strange street we went, I letting the Zoorph lead the way, for I had an idea she must know the city and have some plan, or she would not be here. If she meant to use me to escape into my world, I was all for her.

THEN, from ahead, came the sound of feet, many of them in unison. We darted into a doorway, crouched behind a balustrade. Nearer came the feet, and I peered between the interstices of the screening balustrade. The feet came on; slow, rhythmic, marching without zest or pause or break, perfection without snap. As the first marching figure came into sight in the moonlight, I shuddered to the core with something worse than fear.

For they were men who were no longer men! When Barto and Polter and Noldi had been carried off unconscious, Nokomee had told me:

"They are not my people. They go their way and we go ours. Time has made us a people divided. Time, and a *cruel science.*"

These were the mole-men, the crab-men, the creatures built for specific purposes as tools are built. Each *thing* bore on his back a bale of goods, or a bar of metal, a burden sizeable enough for two ordinary men. They were strong, and they were silent and smooth-moving as machines. I realized they *were* machines—made out of flesh.

"Are these slaves, or what?" I asked Carna.

"These were once the slaves, or workmen of the race of Zervs. They now serve the Schrees, for they are mindless, in a way. They are not important. It is those who guard and guide them I wait to see. I have not yet seen a Schree, but only heard the Zervs describe them."

The nightmare procession went on for minutes, long minutes that were to

me a nightmare. Yet I realized that if I had been raised to the idea of human-kind made into machines, it would not be revolting—not after they had been hereditarily moulded for centuries into what they were. Yet what a crime it was, what they might have been if left to develop as nature intended, rather than as man cruelly mal-intended. They must have been once specially selected for strength as well as beauty, for about them was a sad and terrible grace, a remainder of noble chiseling of brow and nostril, distorted as by a fiend into the horror that it was—these had once been a noble race!

"Do you feel the terrible horror of this sight?" I asked Carna.

"Always I have felt the horror that was done to them in the past. It is *still* done to man. Look, there are the three who came with you, and fell into the hands of *the priests*. They are the thing that the Zervs *really* fear, yet they live with it, and have done so for centuries. They can despise the Schrees, but they are as bad themselves—look!"

I followed with my eye her pointing finger. Yes, that figure *was* hulking Barto, and I almost yelled "Jake, snap out of it!" before I remembered my own peril.

Then he came into the full light, and passed not twenty feet away. I leaned against the railing of stone, sick as a dog and retching. They had made him over, with some unknown aborted science of an evil world! Jake was club-footed, lumbering, with his jaws grown into great jowls of bone, his arms elongated and ending in hooks. Two of the fingers, or the thumb and finger had been enlarged or grafted into a bone-like semblance of a crab's claw. What he was going to be when they got through, I didn't know, but neither did Jake. He didn't know anything! He clumped along, his crossed eyes unmov-

ing, his back bent with a weight heavy for even his broad shoulders—a man no longer, but a mindless zombie. A cross-eyed zombie!

I cursed silently, tearing my hands against the stone as I resisted the impulse to fire and fire again upon those hopping, thin, white things that came after.

"Just *what* are those hopping things?"

"They are a separate race, who have lived with both Zervs and with Schrees. They are a part of our life. You have dogs, horses, machines. We have *Jivros*—that is, priests—and we have the workmen we call Shinros, and too, we have the Zoorphs!" She laughed a little as I stared at her. "Do not worry, the Zoorphs are not really so different. But the Schrees and Shinros *are* different."

"Damned, beastly, demoniac life it must be."

"To you, who expect things to be like your knowledge tells you it must be. To us, it is our way. For a Zerv, or for a Schree, it is a good way. The Jivros do the supervisory work, the Shinros do the hard work, and the Schrees take it easy and enjoy life. Why do you have machines?"

"Machines are not alive. That is different."

"Neither are the Shinros alive, they only seem so. They do not know what they have lost—it is much as if they had died.

"But come, I must show you where we can get a ship to take us away from this and into your world. I have a life to live, I want to *live* it! You—have a message to deliver to your people, or they will become the Shinros of the whole race of Schrees. I do not like to think what can happen to your world!"

I FOLLOWED her again on our furtive way among the shadows. She

was swift and sure, and made good time. She knew where she was going. It was a broad open space deep within the city. On three sides were wide closed doors like hangar doors. The fourth was a massive structure of rose granite, beetling above us, a monstrous shape in the dimness, throwing a shadow half across the paved space. We raced across the shadow toward the nearest doorway, flattened against it, listening for life inside. Carna worked on the catch of the door, after a second slid the door aside slowly, carefully. Inside I could see a shimmering smoothness, round, higher than my head, a top-shaped object. I guessed that this was the ship she meant to steal from the Schrees. Suddenly the door she was sliding open scraped, and emitted a shrill, high-pitched sound. I did not know if it was an alarm activated by the opening door or just rust on the rails and wheels of the door mechanism. Carna cried:

"Hurry, get into the ship, we must take off at once. They will come; they must have heard that sound!"

I ducked into the darkness, circled the bulging shape, looking for an opening. Smooth, there seemed no way I could find.

"Here it is, help me open it," Carna panted behind me.

I leaped to her side. She was twisting at an inset handle around which faint lines indicated the door edge. I pulled her aside, took hold of the handle, twisted hard. It bent, then gave, and the door swung easily open in my hands. We tumbled in. Carna raced through the first chamber, and even as I got the door closed, the floor lifted under my feet easily, drifted out of the wide doorway, shot upward so quickly I was thrown to the floor. I lay there, the increasing acceleration pressing me hard against the cool metal. After a

time I struggled up, made my way to the woman's side.

Ahead was the moonlit range of mountains. Carna was setting a course straight along the ridge of them, heading southward.

"How far will this thing fly?" I asked.

"It will fly around your world many times, if I want it to."

"What kind of fuel does it use?" I asked incredulously.

"I don't know what that is. It uses a substance we call Ziss. It is a good fuel."

"It must be!"

I looked back along the ridge of the mountain's top toward the valley we had left. We were in a bubble on the top of the flat, circular ship; one could see in any direction. Back there a series of glowing round shapes shot upward, came after us in a long curve that would bring them ahead of us on our course. Carna changed her course to parallel the pursuit, and they changed again, to intercept her new direction. Again she changed, circling farther west.

But it was no use! Rapidly they overhauled us.

"Can't you get more speed out of it?" I shouted at her, for they were very close.

"We have been unlucky, my friend. This ship is not in good shape. There is something wrong with it. I cannot make it go as it should, or there is something I do not know . . ."

Swiftly they came up with us, over us, and beams of light shot from them down upon us. The ship was held now, rigid. One could feel the acceleration cease. Like a bird on a string we followed as they swung back toward the valley. Minutes later we were being lowered into the open space we had just left. I clicked the safety off my rifle,

loosened the gun in my holster. I covered the door, shielding myself behind the round shape of a machine. But Carna put a hand on my weapon, shook her head.

"If you kill some of them, they will make of you a Shinro. If you submit meekly, it may be I can talk to someone and save you. I have ways. I understand them. They will be glad to get me, and I will tell them *you* know many things they need to know. I can save your life. Later we can try again, in another ship. Next time we will not be so unlucky."

It sounded like sense, and I looked into her deep eyes searchingly. She meant well. Perhaps she could do what she said. I did not know these aliens; she was almost one of them.

As the door opened in the side, I lay the rifle down, stood with crossed arms as the thin, hopping horrors came near.

THESE things had *never* been men. They had faces that were empty of features, just flat, shiny, gray eyes, two holes where they breathed, no mouth that I could see. There was a long neck around which the collar of their white robe was gathered in folds. Their hands were horny, like an insect's claws. They were not human, they were only four-limbed, and walked—or hopped—in an erect position. There the resemblance ceased.

They led us out, Carna rattling off a series of sounds I could hardly follow. Something about:

"We had to flee from the Zervs, we did not believe you would take us in, we had to steal a ship. I am Carna, a Zoorph of the first grade, and this man is a native of the United States, the greatest country of this earth. Do not harm him, he can help you if he wishes."

Her words must have had quite an

effect, for the weird, insect-like men examined me with their eyes as we hurried along, across the hangar space, into the big building of rose granite. Within twenty minutes we were entering a tremendous room, and Carna nudged me.

"Their boss, Carl! Look impressed."

It was easy to look impressed. I *was* mightily impressed by the *She* on the throne!

* * *

I HAD no eyes for the score or so of Schrees that surrounded the massive carved chair, even though I was curious about their difference from men. Above them were her sleepy eyes, wide almonds, molten and wise, incandescent with intense inner fire above a mouth that was a wide, scarlet oval torn into the whitely-glowing face.

A great black pelt softened the harsh lines of the throne, framed her chalk-white body so that it curved starkly sensual, dominating the great chamber with beauty. It was a beauty one knew this woman used as a tool, a weapon, keen and polished and ready, and it struck at me swift as a great serpent, the fires behind her eyes driving the blow.

She wore a kind of sark of shadowy black veil, sewn over with sparkling bits of gem. It was in truth but an effective ornament for the proud firm breasts, the narrow waist, the arch of the hips and the curves of her thighs. Inadvertently I let out a low whistle of approbation and astonishment. Carna, beside me, nudged me sharply, and I snapped out of it.

The purple, lazy lids of her eyes moved, the slow weary-wise gaze centered on me, her hand moved. In two strides a man from the throne-side had me by the arm, and another seized my other, tugged me forward to her feet, thrust me down on my knees. Still, I looked. Curiosity and something more

held me in a grip I couldn't shake.

This was more than a woman, I sensed. There was an awe of her throbbing in me. Not fear—something deeper, something one feels before the unexplainable, something one feels gazing at the moon and wondering; an ominous, deep, thrilling and unexplainable emotion.

Closer, I could see her firm flesh was dusted over with a glittering powder, the soft curves of her hair swept back to mingle and lose themselves in the black fur of the pelt so that the night-black hair seemed to spread everywhere about her and melt into the shadows.

Her hands were sinuous as serpents, the fingers tapering, the nails very long like the Chinese. Her nose was exquisite, but thin-edged, and with a cruel line on each side that vanished when she spoke:

"It is death to strangers in this valley . . ." she mused, not speaking to me or to anyone, but with a cruel intent to toy with me in the words, mocking, waiting for me to answer.

"I have been long on the way," I answered, in much the same tone, as though we were speaking of some one not present.

"The way to death is sometimes long, and sometimes short. And, too, there are things worse than death. But what was it you came here seeking?"

"I did not know, until just now," I answered, still looking at her eyes, which glanced at me, then away, then back again. She was interested in spite of her apparent weariness with routine—or perhaps with life itself.

"Now that you know, will you tell me?" She smiled a little, not a good smile, but a secret jest with herself. An appearance of extreme evil sat for a moment on her face, then went again, like the wind. Her voice was grave, careless, yet modulated with an extreme

care as if she spoke to a child.

"I seek the wisdom I see in your eyes, to know what is and why it wears you. I want to know a great many things, about your people and what they do here, what they mean to mine, what your plans may be—a great many things I need now."

The sleepiness left her eyes, and she bent toward me with the grace of a great cat and the shadows circling her eyes lifted a little. Wise, aloof, indifferent, yet she did not know what I was, or what I meant, and she meant to find out.

"So you know . . ." she mused, as if to herself.

"I know you are from space. I know it has been a long long time since you first touched here; your people, that is. I know that you drove the Zervs from this city and took it for your own. But that is all."

"It is too much. You cannot leave here." Her voice was sharp, and I was surprised to learn that she had even considered letting me go free. It was encouraging, after the dire pictures the Zervs and Nokomee had drawn for me of these Schrees.

I looked curiously at them, the Zervs had called them "not human." They *were* different, as a negro is different from a white, or an Oriental from a Finn. Their eyes were wide-set and a little prominent, their ears thinner and smaller, their necks very long and supple—different still from the Zervs. Yet they were a human race. I had misunderstood—or I had not yet met those whom the Zervs called Schree.

CARNA had knelt beside me, and I murmured to her:

"Are these the Schrees, or something else?"

"These are the high-class Schrees, they are very like the Zervs in appear-

ance. The other classes of the Schrees at sometime in the past were changed by medical treatments into a different appearance. It was a way of fixing the caste system permanently—understand?” She answered me swiftly, in a whisper, and the woman on the throne frowned as she noticed our conversation.

Her eyes fixed ours as she said, with a curiously excited inflection, no longer bored with us: “Take these two to the place of questioning. I will supervise the proceeding. I must know what these two intended here, whether others of this man’s people understand us.”

“We’re in for it!” said Carna, and I knew what she meant. Jerked to our feet, we were hurried from the big throne room, down a corridor, through a great open door which closed behind us.

That place! It was a laboratory out of Mr. Hyde’s nightmares.

Up until now I had accepted the many divergencies and peculiarities of the Zervs, the priestly insect-men, the monstrous workers—all the variance of this colony from space—as only to be expected of another planet’s races. I had consciously tried to resist the impact of horror on my mind, had tried to put it aside as a natural reaction and one which did not necessarily mean that this expedition from space was a horrible threat to men. I had tried to accept their ways as not necessarily monstrous, but as a different way of life that *could* be as good a way as our own if I once understood it. There were attractive points about the Zervs and even about these Schrees’ rulers which bore out this impulse toward tolerance in me.

But in this laboratory—or *abattoir*—some nameless, ominous aura or smell or electric force—what it was I know not—struck at my already stag-

gering understanding with a final blow.

Now at last I met the real Schrees! I knew without asking. They seemed to me to be an attempt by the peculiar insect-like “priests” to make from normal men a creature more like themselves in appearance. Perhaps it had been done from the natural urge to have about them beings more like themselves than men . . . and it was plain that the race of the insect-like creatures and of men had become inextricably linked—become a social unity in the past. It was also increasingly plain that the four-limbed insect creatures had in the beginning been the cultured race, been the fathers of the science and culture of this race, had through the centuries lost their dominance to the Zervs and the Schree’s upper classes—had retained the “priest” role as their own place in society. It was perhaps at that time that their science had brought the Schree type into existence. There were perhaps a hundred of them at work in the big chamber—a chamber bewilderingly filled with hanging surgical non-glare lights, filling the place with a shadowless illumination, revealing great, gurgling bottles of fluid with tubes and gleaming metal rods; pulsing elastic bulbs; throbbing little pumps, with row on row of gauges and dials and little levers along the walls.

There were a score of ominous-looking operating tables, some occupied, some empty, about them gathered group after group of white-masked Schrees. These were taller than men, near seven feet, with very bony arms and legs, a skeletal structure altered into attenuation, with high, narrow skulls, great liquid eyes, no brows, hairless skulls showing bare and pointed above the white surgical masks.

Very like the Jivro caste, yes, but different as men are different from insect. They walked with a long grace-

ful stride, not hopping as the priests' class. Their eyes were mournful and liquid with a dog-like softness, their hands were snake-quick and long, they looked like sad-faced ghouls busy about the dismemberment of a corpse—a corpse of someone they had loved, and they appearing very sad about the necessity. Such was their appearance; mournful, ghoulish, yet human and warm in a repressed, frustrated way.

The tall, sad-eyed Schrees turned from the preparation of two rigs like dental chairs, except that they were not that at all, but only similarly surrounded with gadgetry incomprehensible to me. We had stood isolated, waiting, with four guards between us and the door.

As we were each placed in one of these chairs, our wrists and ankles fastened with straps of metal, I expected almost any horrible torture to be inflicted upon us.

They shot a beam of energy through my head and I heard words, sentences, a rapid expounding of alien grammar and pronunciation which sank deep into my brain. My memory was being inextricably written upon with all the power needed to make of me whatever they wanted. But apparently their only purpose now was to give me a complete understanding of their language. An hour, two, swept by, and now the heretofore almost unintelligible gibberish about me became to my ears distinct and understandable words. I was now acquainted with the tongue of the Schrees, far better than little Nokomee had taught me the somewhat different tongue of the Zervs.

Then they wrapped about my waist and chest a strong net of metal mesh, and I knew that now something strenuous was going to occur, for I could not move a muscle because of the complete wrapping of metal mesh.

NOW a metal disk was set to swinging in front of my nose so that I could not see what they were doing to my companion. I watched the metal disk, and saw behind it the tall swaying figure of the Queen enter and approach. She stopped a few feet from my chair, and her eyes were intent upon me. Then a light flashed blindingly in the reflecting disk, it went back and forth faster and faster, and I felt a strong vibration of energy pass in a beam through my head, throbbing, throbbing . . . darkness engulfed me. It was a darkness that was a black whirlwind of emotion. The sense of the desertion by humankind, by God and mercy and rationality swept through me and overwhelmed my inner self. I will never forget the utter agony of shrieking pain and loss that formed a whirling ocean of darkness into which I dived. . . .

In this maelstrom of seeming destruction I lost all grip, had no will, was at sea mentally. Into this shrieking hurricane of madness a calm voice intruded. I recognized a familiar note—it was the ruler herself, her voice no longer bored, but with a cruel curiosity that I knew meant to be satisfied if it killed me.

"Tell me what your people intend to do about the flying saucers they speak of in their newspapers?"

"They do not believe they exist; they are told they are delusions," I heard myself answering. I was surprised to hear my voice, for it came with no conscious volition on my part.

"That is for the public; that is a lie. But what do the powers behind the scenes intend to do about them?"

"They are searching for them, to learn all they can about them. They do not understand where they come from, but they have some information. They suspect they are from space, and

are afraid of them."

"And they sent you here to learn what you could. They brought you the golden statuette to help you gain an entry, did they not?"

I tried to resist the impulse to tell the truth, for I could realize that if she thought I had the power of my government behind me, my fate might be different than if I did not. I tried to say "yes, they sent me," but I could not! I answered like an automaton:

"No, my government has no knowledge of my expedition. I came purely to get gold and for no other reason. Mining is my business."

She gave a little exclamation of frustration. Then after a pause she asked:

"Do you think our way of life and your own could live together in peace, could grow to be one?"

Again I made futile efforts to hide my revulsion and fear of them all. It was no use. The flood of force pouring through my head was more effective than any truth serum.

"No, to me you are horrors, and my people would never consent to live at peace with you. You could never conquer us. Until the last of our cultured members were dead they would resist the horrible practices of your culture."

"That is as I surmised," she mused. "But I would have you tell me why this is so. What is it you find so revolting about us?"

"What have you done to my companions? Do you think men want that to happen to them?"

"That was a punishment for entering here without permission. That would not happen to any but enemies."

"Men could never accept the altering of the shapes of workers, the tinkering with the hereditary form of their children, the artificial grafting upon our race of revolting and unnecessary form changes. Your whole science is a de-

generation of wisdom into evil, tampering with life itself. You are horrors, and you do not know it."

I could hear her steps as she turned and left, tapping angrily upon the floor. After her I could hear the shuffling, heavier tread of her retinue. As the flood of vibration ceased, I began to curse aloud for the undiplomatic truths I had been forced to utter. In seconds my arms were free, and I was led out, a tall grim-faced guard on each side, with a firm grip on my arms. I wondered what was happening to the lovely Zoorph, but I did not get a chance to look. I was thrown into a cell, and the heavy wooden door shut. The thud of a bar dropped in place punctuated the evening's experience with a glum finality.

* * *

I LAY for hours with my mind in a whirl from the effects of the truth ray. Jivros, or insect-priests, moved phantom-like before my sleepless eyes, watching from the dark and waiting. Gradually my thinking became more normal, and I began a systematic analysis and summing up of what I had learned of these people. There were but a few members of the ruling groups, and it was evident the rule was split between the Jivro caste of the insect men and some normal-appearing groups who had divided the power with them in the past. Under these were the Schrees, and under these the malformed working caste or castes. The Schrees had contact with some space-state, the Zervs were outcasts of the ruler caste who had been driven from that space-state—perhaps more than one planet—sometime in the past and had hid out upon earth until recently located by the power that ruled on their home planets. Now they were fugitive and nearly powerless, and I knew the Zervs were few

in number from my own observation. There were perhaps a hundred, perhaps two hundred. They had contact with some of the Jivros with whom they were familiar, but the appearance of Jake and Noldi and Polter among the workmen in the city told me that these Jivros could be traitors to them, could be giving new allegiance to the conquerors of the Zervs. My mind centered on two facts. The Jivro caste were the real source of the evil in these people. It was their unnatural attitude toward human life which had made this race the horror it was, and they were still exercising that evil influence.

Morning came through a high barred window, and after a while food came, slid beneath the door. I did not see the bearer of the food, though I called out in curiosity. He did not answer, only shuffled wearily away.

The morning crawled past, the sun mounted until I could see the golden orb near zenith. Then came what I dreaded, the tread of a number of feet. The bar was lifted; I saw four armed guards and a waiting white-robed Jivro, his protruding pupiless eyes moving as he ran his gaze over my figure. I could not help shrinking from the horror of his examination, brief though it was, for I realized he might be deciding just what freak of nature he could make out of me.

I was marched out, down the corridor, up a long ramp, a turn, along two other corridors, up another ramp. The tour ended before a wide metal door, the guards spaced themselves at each side, the door was opened by the agile, hopping Jivro. I went in ahead of it.

There were but four beings in the room, and I stood before the long, foot-high table behind which the four reclined upon cushioned couches.

They were four divergent creatures. One was the queen, whose name I had

yet to hear spoken. One was a very old Jivro, his skin ash-white and covered with a repulsive scale, like leprosy. The third was a mournful-eyed Schree, clad in an ornamented smock-like garment, from which his thin limbs thrust grotesquely. The fourth was a handsome, long-necked male who resembled the queen. He lounged negligently some distance from the three, as if in attendance upon her. I deduced he was her paramour, husband or close relative, perhaps a brother.

I stood eyeing them silently, waiting. I gathered the three heads of the government were here, and the extra one represented the balance of power in the hands of the queen. His negligent lack of interest seemed to me to be an evident giving of his voice to the queen, if he was a part of this gathering.

The queen's voice had lost its sleepy, mocking tones, was sharp, incisive:

"You present a problem new to us, earthman. Sooner or later, if we decide to remain upon this planet permanently, we will have to meet and conquer, or meet and engage in commerce with the other members of your race. You are the first educated member of your race who has fallen into our hands. We must study your people, and we would like your willing cooperation. Will you give it willingly? Or must we put you to death? Which would perhaps symbolize, even indicate directly, our future attitude toward your races."

"I am quite willing," I said, before I had a chance to bungle it worse, "quite willing to exchange information on your people for the same about my own. However, I doubt that your people will find this planet congenial to an invader who ignores the natives as you have done."

"WE DID not come here to colonize, earthman. We came in pur-

suit of renegades from our law, fugitives who fled when their plots were uncovered. But we are considering the possibility of a permanent colony here, and you could help us. . . ."

For an instant her eyes dwelt upon mine with a peculiar warning expression, as evident as a wink, and the expression was evanescent as a breath. I caught on, and made my face agreeable and subservient. Immediately her own reassumed a harsh, proud set, her voice became even more incisive and cold.

My eyes drifted casually to the blank, cold stare of the old Jivro, to the mournful liquid eyes of the Schree, on to the apparently disinterested gaze of the queen's friend. The only ominous feeling I got was from the eyes of the aged insect-man, and my deduction that they were the source of the evils of these people was strengthened. The chills ran down my back, and something within me thrilled as I understood that this queen was playing a part to please the Jivros, that her interests were actually divergent. Her voice was saying:

"You could help us greatly by explaining your life to us, who are so different; make it possible that in the future trade and cultural intercourse might spring up between the two alien ways of life. There will be no peace without understanding, you realize!"

"I quite agree with your views, and will help you in any way that I can," I said loudly, for the old Jivro seemed to be hearing with difficulty. He leaned back at my words, seemed to relax as if pleased.

The queen turned to her companion, smiled and said:

"Genner, you will see that he is taken care of as a guest, and endeavor to learn what you can from him. I will hold you responsible for the success of

this experiment."

"Very well," Genner murmured, "but it seems to me, Wananda Highest, that we can never allow the wall of secrecy between ourselves and the people of this planet to be breached. To consider doing otherwise . . ." for an instant his eye hesitated upon hers, then he went on, ". . . could hardly be logical, but of course, there is much we could learn from them, and they from us. That, I see, as the only purpose of this exception."

Just then a great hullabaloo broke out in the corridors outside, the door burst open, and into the room three captives were borne, half-carried, half-pushed. I stood back out of the way, and the three were prodded into a row in front of the low table. Among them I recognized with a start my erstwhile guard, Holaf, of the Zervs.

Wananda leaned forward, her eyes glittering with sudden triumph, her voice thrilling with a cruel mocking note.

"More of the skulking Zervs fail to avoid our warriors! Where did you find them, Officer?"

"They were attempting to release the captive Croen female in the crystal prison of the cave of the Golden statue, your highness. Our spies among the Zervs informed us of the attempt."

Wananda's eyes blazed at Holaf. Her voice became more shrill with something almost like fear. The three men shrank back visibly from her fury.

"So it is not enough you plot treason, you must also turn against your Gods? You know the Croen powers, you know what she would do to us all, you included. But so that you can overcome the Schrees, nothing else to you is sacred, nothing too vile for you to do. Away with them, let them become the least among the mindless men."

The tall Schree warriors, their long

faces expressionless, started to hustle the three captives toward the door again. Holaf wrenched free, turned, his face contorted with hatred.

"You have hounded us until we are but few, Wananda the Faithless, but you will never conquer us. We still have your doom in our hands, and it will find you out. Death to you, woman without mercy, creature without soul! These sacred Jivros plot your downfall, and your people pray that they will succeed. The ancient Jivro rule would be better than the justice you administer, you snake in a woman's flesh!"

The Schree holding Holaf's arms let go, tugged a weapon from his belt, struck Holaf over the head with it. He slumped unconscious, with blood running over his face from the blow. The three were taken out, and Wananda leaned back. Seeing my intent face, she waved a hand to her companion, Genner, who rose to his feet and motioning to me, preceded me from the room by another door than that which I had entered. I followed him.

APPARENTLY I was on my honor, for no guard followed, and Genner bore no weapons I could see but a little jeweled dagger in his belt.

As he walked a step ahead of me, I asked:

"Who is this Croen that Holaf spoke of, in the crystal column. I saw her, wondered at her, in the room of the golden goddess. Why do they think she could be released?"

"The Croen are a powerful race of wizards, Carlin Keele. They live far off from our home planets in space, and they have a code of conduct that makes them monitors, doctors, interferers in all matters of other races' business. If she were released, she would at once attempt to overthrow our power, to set up a state after the Croen pattern. It

is their way. They consider themselves as superior to all others, and they do have a knowledge of nature which they use to impose their will upon all peoples. They are worshipped as Gods by many primitive people, and so consider themselves above all laws but their own. She was captured many years ago in an attempt to overthrow the rule of Wananda upon a small satellite planet. Wananda did not kill her, but placed her in suspended animation within the protective crystal plastic. Our queen intends to revive her and study her mind for her wisdom, but we have not had time because of the press of events. Soon, now, she will become a tool in our hands to build greater the eminence of Wananda."

"Peculiar looking creature, yet attractive," I murmured.

"The Croens are physically beautiful, but they are warlike and cruel, they do not desire peace and the way of life of the Schrees and Jivros is an irritant to them. They hate and despise us, and we return them the favor."

I did not reply, but my heart seemed to throb in sympathy with the Zerv attempt to free the beautiful creature from her living tomb.

"Could she turn the tables for the Zervs if they had succeeded?"

"I really don't know," answered Genner, opening a door and motioning me into the apartment. "These are my quarters. There is plenty of room, the place is usually empty of all but slaves. I seldom sleep here myself, preferring more congenial and less lonesome sleeping accommodations. I think you will find it comfortable. I will see you at the evening meal time."

As I walked in, the door closed and I heard the lock click. I was a "guest" with reservations.

Curiously I examined the place, the unreadable books kept in niches behind

transparent sections of the wall, the strange furnishings, at once exotic and comfortless to me. The books I could not get at, finding no way to open the transparent panels which seemed an integral part of the wall. I could not feel comfortable in the seats and lounges, as they were very low, requiring an oriental squat at which I am not adept. I compromised by stretching out along a hard couch raised some six inches above the floor. There were no gadgets to tinker with, the place was to me barren of necessary appurtenances . . . strange people, indeed.

As I was dozing off, the lock clicked in the door, and I sat up, startled to see Wananda glide in and close the door quickly behind her. She was alone, and there was something furtive about her.

"Welcome to my abode, beautiful one."

The woman smiled, an almost human smile; reserved, yet with an unexpected warmth. I waited with intense curiosity for her explanation of her visit.

"I come to you for aid, for I can talk to none of my own. I am in trouble which perhaps no one but you could remedy. Will you give me your honor, will you do what I ask without question, will you be my friend?"

I was taken aback that this apparently powerful personage should be seeking aid of me, a prisoner. I answered:

"I see no reason why you should not trust me, as I know no one here to betray you to. But are you not the supreme power here? Why should you want my aid?"

"Because you do not understand my position does not mean that I am not in trouble. These Jivros are difficult allies for one with blood in her veins. I was raised to be a ruler. The Jivro priests were my tutors and my administrators before I came of age. It is

only reluctantly they have followed the orders from the rulers of our home planets to obey me. They intend to slay me, and report my death as an accident. I live in fear, and I have long awaited their treachery. There is but one hope for me and that is Cyane, the Superior One whom I saved only by enclosing her in that living coffin. That is what I ask of you—to succeed where the Zervs have failed, and to release her and guide her in flight from here. She can lead your people, save them from these monstrous Jivros who have made of my race the things which you see. I would save your people as well as myself. Will you try to release her?"

I LEANED back against the cushions, crossed my legs, took out my pipe. This was not exactly a surprise, but I had not realized the rift between her and the peculiar insect-men was such as to cause her to fear for her life.

"How does one release a person from such a death?" I asked. "In my people's understanding of life, death comes with the stopping of the breath."

"She can be released by an injection of a stimulant which I can obtain for you. She is not dead, but in a condition very near to death, like a spider stung by a wasp. If she were free, she would soon scour your earth clean of the Jivros. Our race needs her even more than your own, yet I must pretend to be her enemy. I must pretend to be your seductress, and worm from you the knowledge which the Jivros will use to conquer and enslave your planet and your people. I must play this part, unnatural to me, of a cruel and heartless ruler, or they will have me killed by some subtle poison which they will call illness. You see, the Jivros are our doctors. Much of the wisdom of our race is in their hands. They are our priests and our adminis-

trators. They leave to us only useless occupations which will not allow us to be dangerous. For centuries they have been taking over every vital function of our life. I am allowed to live only so long as I am a willing tool, and foolish enough to wreak their evil will upon my people. It is a part I cannot continue to play. Every instinct of my being shrinks from what I am forced to order done daily, from what I am forced to allow them to do to human beings."

This was a different kettle of fish than I had expected. This slender, lovely creature, with her hands wrung together in pain and sorrow for her brutally maltreated people, this tear-streaked lovely face contorted with an agony which she had not spoken of to anyone else—this actress supreme, who for all her life had pretended to approve of the alien Jivro's sabotage of her own racial stock—was a heart-rending picture, and her own face told me with its extreme tension that what she said was a fact. But perhaps this alien from space *could* act that well? I preferred to believe her.

"I don't see how you expect me to get a chance to release Cyane of her crystal coffin? I will have no opportunity."

"I will *make* an opportunity. I am not yet alone or helpless, much as the insects would like me to be. This is my only power, that I am the same blood as the people, and not a Jivro. They know that, and constantly try to destroy this strength of mine by making me commit cruelties which I cannot always avoid for fear of such of them as the old Jivro whom you met at the council. So long as I retain his favor, I live. When he raises his finger in the death signal, my days will be few thereafter."

"I think I understand your position. I have heard of puppet rulers before—

woman whom I am delighted to learn has a human heart after all. I am wholly with you, and want you to feel that you can trust me to the hilt."

She smiled and dried her eyes. After a moment she leaned forward, and the glory of her beauty, the near nudity of her utterly graceful body struck at me as she fixed my eyes with her own, her face now intent with will to make me completely understand quickly what she knew must be very obscure to me.

"The Jivros fear the power of Cyane, the Croen captive, as they fear death! The Croens have fought to destroy their power for centuries, on many planets in our area of space. Cyane is one of their greatest. She is a scientist of vast wisdom, and one who has developed a technique of increasing the vitality of life within herself, as well as in anyone she chooses to favor. You could well win from her such gifts, if you should release her. It is one reason I wish to release her, in order to win from her that secret of long life which she holds. The Croens are masters of warfare and she would be able, with only a little help, to develop an attack which they could not withstand."

"If they are so powerful, how is it they have not defeated the Jivros?"

"The Jivros are a very ancient, very widespread race. The Croens came into our space-area recently, as time goes, only three centuries by your time. They were lost. There were only a few hundred in a great ship, and they settled upon a small uninhabited and airless satellite of our home planet, were there for many years before they were discovered. When the Jivros attacked them to destroy them, they found in spite of their innumerable ships and countless warriors they could not harm them. But their attacks angered the superior ones, and they began a campaign of extermination against the in-

sect men's empire. Since the Croen were few, they began to recruit from among the Zervs and other groups who were subservient to the Schrees. The Schrees were the ancient tools of the Jivros, and have always held positions as tributary rulers, since the insect-men themselves found subject peoples obeyed the Schrees more readily. They have always kept the priest-like power and, by poisoning and other devices, remove any Schree puppet who displeases them."

"Go on," I said huskily, her rapt face and intent manner, her utterly lovely ivory body, glittering everywhere with the shining powder which she used, the subtle penetrative scent of her—I was hard put to concentrate upon her words.

"I PLAN to have the crystal pillar opened, perhaps, have Cyane brought to my own chambers, and I will pretend to set up apparatus to read her sleeping mind and so learn from her. Naturally the Jivros will become suspicious of me if I do so, as they fear the knowledge of the Croen which has always proved too great for them. There will be but a few days time between my action in bringing her here, and my own death or her confiscation by the Jivros. But in order to overrule me in this, they will have to make a pretext, charge me with infidelity, convince the old Jivro that I intend harm to him and his. During that time you must find a way to release Cyane and escape with her."

"Why don't you yourself release her and escape with her?" I asked.

"Because I can be useful to her when she attacks us. Besides, I am constantly under the Jivro eyes, and they know me so well they would see my perturbation, they would know something was wrong and forestall me. You

alone could do it, and, too, I depend upon your alien knowledge to provide a barrier or two to their overcoming you. Your weapons which you bore when we captured you—do they fear them?"

"I never shot any of them; I don't know."

"Perhaps I will send you with the party to get Cyane. That way you can find a chance to inject the stimulant when they are not looking. They must remove the crystal from about her to move her; it is too heavy to carry otherwise. Then when she awakes, you can find a way to divert their pursuit, provide a false trail. Do you understand?"

"I could try, but I cannot tell if I could outwit them or not."

"They are really very stupid things, the Jivros. Like an insect, their patterns are fixed and repetitive. They are almost incapable of original thought. Once you know them, you can always outwit them. With you will go my brother, Genner. He may be successful where you are not."

"It is agreed then." I stood up; this low couch made my knees stiff. She took my movement as a dismissal of her, and flushed deeply. I smiled at her embarrassment, and went down on one knee to bring my face level with hers where she half reclined on the bench-like lounge.

"Dear lady," I said in English, not finding the necessary Schree words in my artificial memory for a term of respect—then in Schree phrases, "I will do my utter best to help you and your people. It is my duty to my own race, too, as it is yours to yours. Trust me, so far as good-will may go. Together, we will rid ourselves of these unclean Jivros of yours!"

She rose then, and I stood too, still holding her hand that I had seized in

my own to impress her with my sincerity. For an instant she looked at our two hands clasped together, then she placed an arm on my shoulder, leaning against me and trembling slightly with emotion. Tears sprang out in her eyes. She brushed them aside.

I did not know what to do. For fear of offending her, I restrained the impulse to take her in my arms, and it took great willpower.

Something about her aroused my deepest admiration. Here was a woman who had been playing a difficult part for years, whose heart was sore with sorrow for her blighted people, and who must yet seem to approve. The signs of long strain were very plain on her face. I understood that this was one of her greatest fears, that her mind would give way and betray her true emotions to the Jivros.

Clumsily I patted her bare shoulder. For an instant her wet cheek was pressed against my own, then she went gliding swiftly away, her face once again proud and empty of all human feeling. At the door she turned, swept her palm once over her face, removing the tears and as the hand passed upward she smiled as sweetly as a young girl, with a pathetic and utterly charming mischievous expression. Then the palm passed downward, and her face was left again stiff and masklike, the lips twisted a little into a cruel thinness, her eyes hard as agates on my own. She was superb, and I silently applauded. Then she was gone.

AS I stood there, musing on the nature and the strange life of Wananda, a mocking, sultry laugh made me whirl, for I had thought I was alone.

Standing beside the tall, open window—a window I had examined and

found impossible of exit because beneath it was a straight drop of some seventy or eighty feet—was my erstwhile companion and prisoner, the Zoorph, Carna!

Still in her hand was the long, fantastically ornamented drape behind which she had been concealed during my "secret" interview with the puppet queen.

"You!" I exploded. "Where did you come from and what did you hear?"

"Very interesting things, friend Keele. She is a fascinating woman, is she not?" Carna made a pretty mouth, as if kissing something, and with her fingers a gesture new to me, but one unmistakable in meaning. "She now has your simple heart in her hand, to do with as she wishes. You are a fine fool, you!"

"I thought you had psychic powers. You claim to read minds and foretell the future, and you do not understand that she is fine and honest and utterly admirable! You are the fool, Carna!"

She laughed.

"You are right, and not so simple. I said that only to know if your perceptions were keen enough to know that what she said was true."

"Now you know. How did you get here, what do you want, what have they done to you?"

She snapped her fingers, and gave the Zerv equivalent of "pouf."

"They gave me their tongue, as they did you, I notice. They questioned me much longer than you, as they thought I knew the Zervs might be caught. I did not tell them much. But it was my fault that poor Holaf was caught. I did know he was going to try to revive the Croen captive. They wrung that out of me, and then put me in a room directly above this one. I knew that they were below me from the talk of the guards. I made a rope from

the hangings and slipped down to see you. I may go back up when I get ready."

She came toward me as she spoke, her hips undulating exquisitely, that sultry smile of completely improper intent on her beautiful face. She wore still the silkily gleaming black net in which I had first met her. It was torn now and even more revealing.

I fixed my eyes on the wide web of linked emeralds at her throat to keep my eyes from hers, for she had a disturbing power to make a man's head swim and his will disappear. It was perhaps no greater power than many another woman possesses, but to me she was particularly devastating. I moved back as she came toward me, smiling a little, and said in spite of my liking for her:

"Keep away from me, Zoorph! You will destroy my soul!"

She laughed huskily.

"What is a soul or so to the passion that could burn us, my Carl? Do you really fear me, stranger from a strange people? Don't you know how much I thirst to drink of your lips! Look at me, you coward. Are you afraid of a woman? Don't you know how curious I am as to how you of this planet make love? I who am a student of love, am most curious about you. Stand still. Here we are prisoners, about to die, perhaps, and you refuse me one sup of pleasure before we die? You are a cruel, and a spineless creature. I despise you, and yet I want you very much."

I kept backing away, around the room, and she pursued me at arm's length, her long graceful legs dramatically striding, making of her pursuit a humorous burlesque, yet I knew she was quite serious about it. If little Nokomee had not warned me against her, I might have succumbed then and

there, for, as she said—"What good is a tomorrow that may never exist for us?"

"What did you come for, Carna? To make a fool of me?"

"I thought we might try to escape again, but this pretty queen of the accursed Schrees has charmed you to her will, and I must await a better opportunity. But that does not prevent me from trying to outdo her attraction for you. Do you love her already, Carl?"

"Of course not, I just met her."

This was utterly ridiculous, yet it was a lot of fun and I could see no real reason why I should resist Carna's advances. To me she was about the most attractive woman I had ever met, and I might never see her again. I gave up my retreat, seized the girl almost roughly in my arms, bent her back with a savage, long-drawn kiss and embrace. Then I released her, to see what she would make of an earthman's kiss.

SHE stood for an instant, her hand pressed to her lips, her eyes wide with surprise, one hand raised as if to push me away. Then she giggled like a young girl, and put both hands on my shoulders.

"So that is what you call love, strange one? Shall I show you how we of far-off Calmar do the first steps of courtship?"

"That would be interesting," I said huskily, my lips burning.

Her voice became low and penetrating.

"You will be two, yet alone, above the all." She said other words whose meanings I did not know. My head swam, my soul seemed to be floating in a sea of new and strange emotions. I sank into a dream state, and with her low suggestive words in my ears, a new world came gradually into form about us, we were two lovers walking among

plumed fern-trees, beside deliciously tinkling streams, the songs of birds rang like little bells all about. I was conscious of her warm lips upon my own and of her eyes like two deep dark pools in which my own gaze swam and sank and rose.

Suddenly a rude, loud voice broke in, the dream of paradise vanished from about us.

Before us stood Genner, his face angry, and in the wall I saw the panel by which he had entered where I had thought was only blank wall. He cried:

"You, Zoorph, I had thought not to interfere. But you are not going to enslave this man to your will. We need him, and your people need him too, and what you do is not right, for you know as well as I that if he falls entirely under your spell he will be left no will of his own!"

Carna, not even abashed at the intrusion, almost spit as she angrily retorted:

"What is the difference whose will he obeys so long as it is what we all desire that gets accomplished? He would be better off with my experienced direction than with his own ignorance of our ways, in anything you plan. Do you think I want to be left out? Do you think I do not desire freedom from the Jivros, too? Do you think I want to be made into a mindless thing when I fail to please them?"

"Never mind; get back where you came from. This man is our ally, not our slave, and your behavior is bad. I will hold this against you. Go!" He pointed at the window with one rigid, outstretched arm, and Carna moved slowly away, saying:

"No, Prince, do not think me an enemy! It is only that my heart *is* moved toward this strange one, I wanted him *very* much, and how else can a Zoorph love than as she has been taught?"

The prince smiled at her words, his arm fell to his side.

"Very well, little temptress. Kiss your love goodbye. It may be a long time before I let you see him again. If he desires it, you may meet later on. But I will warn him, so that he does not become your slave."

"I would not rob him of his self, my Prince. I have an affection for this one!"

"We will see that you do not, sweet Carna. Now get out, and be quick. The time approaches."

She darted to my side, where I sat still bewildered by the eery yet utterly delightful experience with the witchery of a Zoorph, pressed burning lips to my own, caressed my cheek with her fingertips, gave my hand a quite American squeeze. Then I watched her slender legs swing up and out of sight as she went up her improvised ladder hand over hand. She was athletic as a dancer.

"Whew," I said, passing my hand over my heated face, and grinning at the Prince.

"Yes, whew! If it had not been for me you would have become her property, for they are very accomplished in making people do what they want."

"Hypnotism, developed beyond anything I ever heard of! It must be hereditary, such power!" I mused aloud. Genner answered as if I spoke to him.

"The word hypnotism I know not, I guess you mean what we call Zoorph. It is a cult, teaching the art of enslaving others to your will. But she is a good girl, and her Zoorph qualities are not evil. For your own sake, remember always to hold yourself in check, or she will automatically become your mistress. A man does not like to be a slave even to so charming a mistress."

I did not say anything. I saw noth-

ing wrong with the idea just then.

"Were you there behind the panel while your sister and I talked?" I asked.

"Of course. To make sure nothing went amiss. If some curious Jivro had come to the door, she would have joined me in the passage."

THE Prince sat down across from me on a low stool.

"I will lead this group she will send to bring the Croen. You will naturally accompany us, as I am to keep an eye on you. Wananda will give you the fluid to inject into her veins. You must not be seen making the injection. Somewhere along the way she will revive. She is an extremely strong creature, and will immediately make her escape. I will order none to shoot at her with vibro guns, as we do not wish her harmed. We will hurry back to get ships to pursue and capture her. But we will be unable to capture her.

"If you can manage to keep up with her in her flight, do so. You should be able to outrun a Jivro; they are not very fast. But whether you can keep up with the Croen, that I doubt. However, make the attempt, and when you are alone with her, explain why we want her to escape, who her friends are. If you do not do that, she may elect to make her way through the wilderness, which would be fatal for her. Knowing she has allies among us, she will find a way to attack us."

I grunted. I did not see how they expected one lone woman, however fantastically gifted with wits and know-how, to overcome the ships, armament and organization of the Jivros, even with Wananda working to neutralize their power.

"She must be a wizard; you expect such wonders of her!"

"There will be a ship waiting to pick

her up as soon as she is out of sight of the Jivros who will accompany us. I have sent it already. It waits in the hills by the barrier. With you along, you can contact the remaining Zervs. They will augment your power. I can send more ships manned with my men, later. We have been preparing for this a long time."

"Aren't you doing a lot of talking? Walls have ears, you know, and those Jivros of yours look pretty shifty to me."

"It is the hour of their sleep. They are creatures of regularity, like ants, you know. They live by routine. There are only guards awake. I know exactly where every one of them stands at this moment, where every one of them sleeps. I have not been inactive."

* * *

WE FILED out of the city gate, a party of nearly fifty, a score of them bearers of a big palanquin-like vehicle in which they proposed to carry the Croen's inert body.

I was remembering the brief examination of her that I had made when I entered the cavern of the golden statue.

A four-armed female of near-human aspect, but with a single horn on her forehead. A member of a race from distant space, alien even to these visitors to earth. She had been utterly different from anything I had even imagined as human—yet somewhere, somehow the origin of that race had been similar to our own. I wondered if space was peopled with such near-human races, all descendant from some ancient space-traveling race who had colonized—then passed on into forgotten time?

The party wound on, taking that same trail by which I had entered the cavern with Hank and Jake and Frans. Silently I blessed the fate that had spared me the things that had been

done to them. Their only release, I imagined, could be death.

Overhead the rocky walls began to close, the light grew dim, ahead came that eerie glow from the magnetic statue. The prince's eyes caught mine in a swift, silent order to be ready, and the two of us drew ahead of the column. In my jacket pocket I held the hypodermic, one of Schree design, different from a modern medical hypodermic only in that it was decorated with incut figures of glorified Jivros, carved in the crystalline cylinder, and the metal was of gold.

There were only two of the repellent insectmen with us. I surmised they were there only as observers, but that was not the case. They were there because they had to be. I could see an unusual agitation on their blank, bulge-eyed faces, if those insect masks could be called faces. They were afraid of this Croen female, even in her inert condition.

The tall, graceful Schree warriors followed us into the cavern, and last of all came the two hopping Jivros. The intense attraction of the statue drew me, but I remembered how I had avoided it before, and kept my eyes averted. Like light on a moth's eyes, the power of it seemed to strike into the will only when the eyes were upon it.

We gathered around the column of crystal. The Schrees attached a loop of rope to the top, pulled it carefully from the base. When it was stretched out horizontal upon the floor, the two Jivros set to work with little spinning metal disk-saws, cutting a line entirely around it lengthwise. Then they tapped it with small hammers, and the cut cracked through. Lifting off the top section like the lid of a sarcophagus, the Croen lay exposed to the light of day.

I stood entranced by the exquisite beauty and majesty of the naked creature until Prince Genner nudged me with an elbow. Even as he did so, he whirled, pointed, cried out:

"There, through that doorway, one of the traitorous Zervs spies upon us. Catch him, my warriors, before they bring the others down upon us!"

As if drilled or awaiting this order, the tall Schrees set off as one man, running through the same doorway by which I had followed the angry Nokomee.

The prince and I were left alone with the two Jivros, who stood beside the nude figure of the alien Croen. They eyed us, their eyes jerking nervously from our faces to the body of the Croen. Quite calmly the Prince tugged a vibro-gun, very like the weapon Holaf had worn at his waist, from his belt and trained it upon the two horrors.

"This day will come for all the Jivros," cried the prince in a triumphant voice, and shot a terrible blue bolt of force into the body of each of them. The second had snapped a little weapon from his breast, hidden in the folds of his white robe, and as he fell, the beam of it cut a long smoking channel in the floor rock. The prince calmly picked it up, pressed the trigger lever, handed the thing to me. I pocketed it, then stepped over to the nude body of the Croen. I inserted the needle carefully in the artery at her inner elbow, pushed the plunger slowly home, my eyes on her face with a deep awe.

The prince bent beside me, watching her face intently, and both of us stood rapt, waiting for I knew not what except that it would be more marvelous to meet such a god-like creature as this face to face than anything else that had ever happened to me.

But a sound of feet up the corridor

made Prince Genner spring to his feet.

"Quick, man, help me get these dead horrors out of sight! I do not trust all those warriors, though most of them are in sympathy with us."

WE SPRANG to the dead things.

I bent and picked one up by the shoulders. Surprisingly, frighteningly light they were, as if filled with cotton. Their limbs were truly skeletal, and curiously I tugged the white robe from the strange insect body as I followed the prince. The thorax, the wasp-waist, the long pendulous abdomen, the atrophied center limbs folded across the wasp-waist—the whole thing was like a great white wasp without wings. As we flung them into an empty chamber, I turned the burden face down, and on the back were two thin wisps of residual wings. Once these things had been winged!

We sped back to the side of the sleeping Croen.

I stopped ten feet from the giant figure, surprise, awe, a thrill of admiration filling me! She was sitting up, her hands at her temples, peering about with her great eyes distracted. On her face, even in this condition of tension, still unaware of her surroundings, was the greatest evidence of intelligence I had ever sensed. This Croen race, I realized, was something truly beyond an earthman's understanding.

But the prince had no time for the awed, stupefied condition into which sight of her had struck me.

"Come, Cyane, great one, we have released you, but you must flee at once. I know how weak you must be, but if you can, please rise and flee. This man will accompany you. He is alien to us, and it is better that he be out of the hands of the Jivros as quickly as possible. Go, dear one, swiftly, swiftly—we will find you later!"

The great body moved, gathered itself, stood tottering, gazing wildly about. The prince pointed at the cavern entrance where our footprints still showed in the dust. To me he cried: "Go up the rocky side as far as you can when you reach the slopes. The north side, earthman. Keep going, and conceal yourselves in the bush. I will guide the search away from you."

I ran ahead of the tottering figure and she followed, her steps gathering strength. Faster she followed until we raced along the dim cavern way. The rocky roof opened out and the blue sky showed overhead. The prince had gestured to me when we had entered to a ledge that angled upward from the gully, and I knew now what he had meant.

I could not keep up with the great strides of the now fully aroused Croen goddess. She turned back, picked me up like a child, and in great leaps bounded up the side of the canyon along the ledge. Up and up and over, and still she ran, untiring. I was not rescuing, I was being rescued!

As we ran beneath the shadow of the trees, a figure rose suddenly up before us. I was astounded to see it was Holaf, whom I had thought the Jivros had already dealt with.

"I await you, Cyane, great one, to guide you to safety. The prince has sent me," he cried.

The great striding creature slowed, spoke to me with a voice full of a deep music.

"Do you trust this man?"

"He may be trusted in this case. He has already risked his life to set you free."

She set me down. I looked at Holaf, who was too excited to be amused.

"Hasten, we must get under cover at once. A place awaits, and many men, arms, tools. We have long fought for

this day, Cyane!" Holaf was wholly ecstatic to see the success of his plans. I realized the prince had made an ally of him with the same kind of interview the queen had granted me.

Holaf led us around the side of the mountain, keeping in the shelter of the trees, and by a back route to the same hideaway in the mountainside where I had first met him.

I greeted Nokomee with a glad smile, but her smile was not so glad and my heart was hurt to find she was angry with me. But the great Croen creature left us no time for argument.

The caves where the two hundred or so Zervs had hidden for so long were quite numerous and confusingly branched. There was room there to hide an army if needed.

I WENT at once to the small chamber where Nokomee had placed the packs and camping equipment from the horses, and took out one of Hank's big old forty-fives, belted it on. The old-fashioned belt was filled with cartridges. I also took my own Winchester Model .70. I had a plentiful supply of 130-grain Spitzer-point bullets, a high-velocity, long-range killer that I might get a chance to use. I filled my pockets with cartridges, took a knapsack and filled that. So, burdened down with lethal equipment, I hurried back to Cyane's side. I didn't want to miss a move of that visitor from far space. I wanted to learn, and I had an idea she would show plenty of science if she got into action. The prince wasn't gambling on her for nothing, not with that glorious sister of his in jeopardy.

She had seated herself on that same big bench where I had first met the Zoorph, Carna, and the Zervs were coming and going to her rapidly-given orders. A dozen of the older Zervs

were assembling apparatus under her direction, and if I expected to learn something, I saw I was going to be disappointed, for the stuff was inexplicable to me.

I went on outside to the ledge from which the city could be seen. I was worried about how Genner had explained to the Jivros the death of the two who had accompanied him. I had taken a pair of small binoculars from my packs, and seeing activity near the gates of the wall, I trained the lenses upon the wall.

I gave a cry which brought the Zervs speeding to me. I handed the focused glasses to Holaf, pointed at the gates. He put them to his eyes, then he too gave a cry of warning, and raced back to the Croen.

For, filing out of the gates and spreading out across the valley was the vanguard of an army. The glass had shown the streets filled with marching men.

For a few minutes I could not understand exactly what had happened, then I guessed. The prince had asked for permission to use the entire forces of the city in a search for the Croen! The strategy of the man was exquisite. He was playing on the Jivro fear of the Croen to get the military power fully in his hands!

Even as the great limbs of the Croen woman brought her to my side, as I handed her the glasses, round disk ships began to rise from the center of the city one after the other until at least five score of the smaller type were in the sky. After them came two of the larger craft that I knew were really space ships with huge inner chambers in the bottom where the small craft nested.

An all-out search for the Croen was on in earnest!

But now quite suddenly an astonishing thing happened. One of the great

mother ships swung in a circle, came alongside the other, and from the great center bulge of the upper surface a blue beam lashed out, struck the other in a slicing flare and sheared off the entire upper bulge in one blow. The great ship faltered for an instant, then began to fall. It struck the ground near the wall with a blinding explosion. As the great mushroom of white smoke began to lift up, the stem of the mushroom blew away, and where the ship had fallen was only a hole, surrounded by bits of shattered metal. The wall near the explosion was breached in a fifty-foot-wide break, and the bodies of men could be seen through the breach, killed by concussion.

From the city a blazing yellow beam lanced here and there in pursuit of the traitor disk, but it darted like a dragonfly, up, down, and zig-zag. The pursuing beam came nowhere near it. Somehow I knew the prince, and perhaps Wananda too, were in that ship, and my heart was in my throat as I thought of the queen in that ship, being shot at by the repulsive insect men.

THE army deploying on the plain kept right on marching, columns slanting outward from the center, forming three columns that spread out like the extending prongs of a trident. I could make nothing of it.

Several dogfights had broken out among the smaller disk ships since the fall of the mother disk, but these were quickly over, and the flight came on, swift as arrows.

The remaining mother disk settled to earth on the level land directly below our hiding place, and the smaller disk settled now around it. The army marched on, nearer and nearer.

I looked at Holaf, handed him the glasses.

"I don't know whether we are lost,

or whether the prince has joined us, deserting the Jivros in the city you Zervs built."

"None but Prince Genner knew our hiding place, and who else would place themselves under our fire range, knowing we were here?" Even as he spoke, the door opened in the side of the great disk, and the prince sprang out, turning to assist his sister to the ground.

The Croen, Cyane, standing beside me, suddenly leaped off the ledge, her long limbs making easy going of the sloping detritus below. Seconds later she was running easily across the plain toward the ship, and I was surprised to see the prince and the queen bow their knees to her, kneel before her as if praying to a goddess. She touched the bowed heads with her fingertips, and the three figures then entered the disk and the door closed. The ship lifted, took off alone in a southerly direction, flying higher and higher and out of sight. Even as it disappeared, another great disk lifted from the city, set out in the same direction in pursuit.

But the smaller ships below lifted at once as they sighted this pursuit, set out after the second mother disk.

"I guess we're going to miss the fighting," I said to Holaf.

"We can get into it when the time is right. We've got to move at once. The Jivros know our location now. Come on!"

Holaf strode back into the cavern that had been the Zerv's hideout for so long. I followed, stopping curiously to examine the apparatus which the Croen had abandoned on the advent of the prince. It was a kind of still, bubbling now with a wick lamp under the red fluid, and nearly a gallon of the end product had collected in a big jar.

"What was this distillation all about?" I asked Holaf.

"It was a medicine she was making

for the Shinro. She said that an injection into their blood would increase their perceptions to a human range of intelligence, and that then we could use their resulting rage against their mutilators. It is only a temporary effect. It will wear off in a day, leave them again to the stupidity the Jivros gave them. Now, she's gone, I don't even know the dosage. It is useless, the prince took her from us."

"We can use it, if it is complete. I have the needle I used to revive the Croen. Bring the stuff; we'll try it."

"We could circle the army, get into the city . . ." said Holaf, his eyes glittering on mine.

"Let's go," I cried, getting his idea.

* * *

WE WERE near a hundred and fifty young Zerv fighters, and perhaps as many women and old men and children. We wound through the passages of the tunnels in the mountain, came out on the far side from the valley. Along the mountainside we traveled, and I realized we were at the mercy of any force we met, being too few and too hampered with baggage and the helpless members of the Zerv families.

But Holaf knew what to do. He pointed out a trail toward the wilderness to the thin little column, told them where to take cover and await his return. Then with myself and a dozen of his best warriors, he turned his face again toward the Jivro stronghold.

We circled the valley, marching hard, crossing the upper narrow end. Coming toward the city, twilight was closing down, and we made the last few miles in complete darkness.

Near the walls, Holaf chopped a thirty-foot sapling, which we carried to the wall. A young Zerv swarmed up the pole, let down a rope to help the ascent of the others. I climbed the

rough pole after him. I hadn't the athletic ability of these Zervs who seemed to like to climb ropes hand over hand. So over and down into the silent city we went, drawing up pole and rope after us, hiding them in the shadows of the wall.

Like shadows we stole along the streets, and after long minutes heard the unmistakable feet of the Shinros. They came with that ghastly mechanical rhythmic tread, eyes staring, backs burdened. I guessed that now their burdens were materials for the defense of the wall. We followed, and not far distant from the breach of the explosion of the disk ship, found our chance. They were accompanied by four of the hopping Jivros, and upon the back of each a young Zerv sprang, silent as stalking cats, striking them down, crushing their skulls with vibro-gun barrels.

Holaf and I set to work immediately on the mindless Shinros, injecting shots of the red fluid into their veins one by one, varying the shots to gauge the effect. But it was potent stuff, and before I had the third man under the needle, the first was speaking in a hoarse, angry voice.

"What has happened to me, what—what?"

Holaf said: "These are almost all graft jobs, were once captives and normal men. The result, if this shot works, is going to be a thoroughly angry man, fighting mad for the blood of the Jivros." Then he raised his voice to the newly revived Shinro.

"You were made into a beast of burden by the Jivro insects! Tonight you will get your revenge. This shot of sense we are giving you will last only till daylight, so your life does not matter—it will revert to the beast in the morning. Go and spend your time where it will hurt the Jivros most—

spill their blood. Their power is ending this night! This is the beginning of the end for all the Jivro parasites of our race. What we begin tonight will not stop till every Jivro in the ancient Shree group of planets is dead and gone!"

As we completed our injections, the column stood waiting, but a column of sane men, ready to shed Jivro blood for their revenge.

"Go as if to get more burdens of stone to repair the wall. When the Jivros show themselves, kill, get weapons, do not stop killing until they are gone or you are dead. You have but this night; make the most of it."

The column plodded off, in the same apparent condition we had first met them. But in their brains was boiling, enraged sanity, in a condition of complete rebellion, of murderous intent.

"They'll sell their lives for something worthwhile, tonight," said Holaf into my ear, as we set off on their trail. We intended to make the most of any opening the revived Shinros made for us.

TWO more columns of toiling Shinros we liberated with injections, then our supply of fluid was exhausted. Just what more to do to hurt the Jivros we didn't know.

"How many ships do those Jivros have? Why are they always in hiding? Since I've been around here I haven't seen a dozen of 'em at one time!" I asked Holaf, my feet tired from sneaking along the deserted streets.

"They never come out in the open except for some express reason, such as driving the Shinros to work. They still have probably a score of ships."

"Twenty of those big disks?" I asked.

"Yes, I would say that many. But they will not bring them out to battle unless there is no other way. A Jivro

never does anything he can get a human to do. Now that they have only the Shinros in the city, with the army out there searching for the Croen—and maybe the most of it deserting to some rendezvous the prince sent them word about—they will do nothing unless they must. You know how a spider hides when it senses danger?"

"There are many insects that hide when they are in fear."

"They have that trait, but they also have courage when desperation drives them. Now they are holed up in their strongholds, waiting developments. They will only come out to fight if they see an opportunity to crush their opposition, or if they are driven forth."

Suddenly the long beam of a searchlight lanced across the night sky above, then another and another. For an instant a huge disk showed in the beam. It tilted and drove abruptly sideways out of the light. The beam danced after. It was not seen again, and still more beams winked on, began to search, systematically quartering the sky.

"I would say our friends, the Jivros, were in for it. The prince and the Croen are attacking," I said to Holaf. He grunted.

"I didn't expect it so soon. They do not have the strength in ships. But the Croen must have some stunt figured out to equalize their power."

We moved along pretty rapidly, keeping to the shadows, and soon were again at the side of that flat, paved place from which the disk ships took off. Overhead loomed the beetling walls of the palace from which the prince had led his people in revolt—manned now by the Jivros. I wondered how it felt to them to have to do their own fighting.

The beams moving about from the top of the building lit the streets about us with a distinct glow. It was no place to remain. We moved back along the

parallel street, and I had an idea. Whatever was I carrying all this weight of heavy game rifle and knapsack of cartridges, and not even getting in position for a shot? I gestured to Holaf and tapped the rifle, pointing up.

He got the idea, led me to a dark doorway and we entered the building, made our way to the roof. Lying prone along the parapet of the roof, I adjusted the sights for two hundred yards, and swung the rifle sight slowly across the flat roof of the palace. The reflections of the big searchlights made the surface quite bright, and about each light was a group of the tall white-robed Jivros. They made perfect targets!

I began to fire, taking my time, centering each figure exactly. At each shot, one Jivro fell. I had fired but a score of times, and the white-robed creatures began to leave the lights, to cluster about the archway over the roof stair.

Grouped as they now were, I did not need to aim. I fired four more clips as rapidly as I could load them. Then the remaining Jivros began to swing the great beams in a frantic search for the deadly fire. As the beam swung toward us, Holaf seized my head, pushed it beneath the parapet. The beam swept on without pausing. I raised my head and kept on firing.

All of the beams but two were now stationary and unattended. I could not reach these, the angle of fire was wrong; but I could see the base of the lights, and as they swung again toward me, I fired into the center of the beam. It blinked out. Holaf clapped me on the shoulder.

"Get the rest of the lights, man, never mind the damned insects! The Croen will take care of them soon enough."

One by one I put out the search

beams, the sky overhead grew dark again.

"These are the creatures who expect to conquer the earth!" I cried out scornfully to Holaf. "They could be bested by a bunch of boy scouts with twenty-twos!"

"They have never fought! They are only priests, not warriors. They are not thinking of conquering anything now, without their willing servants. They are fighting only for life!"

OVERHEAD still wheeled the circle of guarding disks, manned, I knew, by the inexperienced priest-like insect men. I took a careful aim at the glowing transparent bulge in the center of the nearest, hoping the alien plastic was as soft as the earth plastics. But there was no way to tell if it had pierced the shell of plastic, or if it had done any harm.

Fumbling in my pockets, I pulled out a loaded clip, lay there pondering with the clip in front of my nose. Absently I noted the black band around the nose of the bullets, indicating it was a high-velocity, armor-piercing cartridge, manufactured by the U.S. Army for exactly such emergencies as I faced. I did not know if it would prove too big a powder-charge for my rifle, I did not know then even how I came to have the cartridges. Polter had bought some Army ammunition and these must have been among his things. I may have been firing them steadily and not known the difference.

I inserted the clip, and lay there with my fore-sight following the disk ship in its steady circling flight. Just where would an armor-piercing steel bullet do the most harm? I shot the clip out at the great round body of the thing, trying to guess where a hit might damage machinery or pierce fuel tanks. There was no visible result, and I gave the

flying disks up as a bad job. How did I know they were built to resist meteors in ultra high-speed space flight? It didn't even occur to me.

"Where're your buddies?" I asked Holaf. He lay beside me peering down into the street below.

"Gone to join the Shinro. They are storming the doors of the palace now." He gestured toward the street.

I leaned over the parapet. Below in the street the hideous, mutilated bodies of the Shinro moved in a mass. They had brought up a huge beam, and were pounding it against the great palace doors. Others climbed toward the tall barred windows, some of them slipped through. But of the white-robed Jivros there was now no visible sign.

I was about to send a few shots through those same windows, when a waving white cloth from a window near the top of the huge structure drew my eyes. A sudden fear struck my heart. Could that be my Zoorph, left there—could that be Carna? I felt sure it was, and something warm and pitiful seemed to flutter in my chest as I thought of her alone among those hopping Jivros. I got to my feet, started across the roof.

"Where are you going, earthman?" asked Holaf, placing a hand on my shoulder.

"I am going into that place, but there is no need you accompanying me. I think I saw Carna at her window, a prisoner! I would like to free her."

Holaf gave a cry of unbelief.

"No, you cannot do that! The Croen means to destroy that place down to the ground. Carna will have to perish with it. It is too bad, but you cannot enter there. I know what is going to happen."

Even as he spoke, a great white blossom of flame spurted suddenly over our heads, spread and spread across the sky above the circling ships. Looking up, my eyes were struck blind. I

dropped to the roof surface with agony. Then came the terrific, stunning concussion. The prince was letting off the fireworks at last! I exulted, even as I despaired. Somehow I only now realized that this waiting, strange Zoorph in her prison, who faced death because forgotten by her friends—*must not die!* In my heart some warm thing she had waked there with her magic breathed, moved, sprang into complete life. I could not see her die! I must get into that place that I saw was doomed, even as I now saw two of the great ships above falter in flight, turn and slide downward at increasing speed. The concussion had broken them, perhaps destroyed the life within them. I realized that in a short time the same thing was going to happen to the headquarters of the Jivros.

Below, the booming of the great ram against the palace door ceased, there came wild shouts, cheers, running feet, terrible screams of agony. I ran down the ramps up which we had ascended to the roof. Heedless of danger, I raced along the dark street, across the wide-open space surrounding the palace.

About the palace door the dead were sprawled in mangled heaps. Among the dead were several white robes, now stained with the pale blood of the Jivros. I surmised the frightened creatures had opened the door, intending to kill the men wielding the ram—and had been unable to do a complete job. The doors gaped open. I stumbled over the reeking heap of slain. A dying man raised one horrible crab claw to me, called out my name! It was Jake, his ugly face now a horror. I had not even known he had received the reviving shot of the Croen medicine.

I bent to hear his words, but he only looked at me for a second, his lips formed one word: "Gold!" He laughed bitterly, repeated it: "Gold, hell!" and

then his head dropped lifeless.

I raced on into the place, and at my heels came Holaf. In his hands he held the vibro gun, and on his face was a wild triumph. He kept crying aloud:

"Death to the Jivros! An end to tyranny!"

I HAD no time for the political angles which so inspired Holaf. I raced upward along the same paths by which Prince Genner had led me to my own detention quarters. I did not know how to reach Carna's room except that it lay directly above my own. I raced into the open door of the prince's quarters, and to that window by which Carna had entered. I leaned out, shouted at the top of my voice.

"Zoorph, are you there?"

Her voice came to me with a message of relief, yet it justified my worse fears. She was here, and the place was about to be blasted by some titanic explosive of the Croen science' creation! Her words were indistinct, but the tone was almost mocking, and I thought I heard her laugh.

"Can you come down, Carna, or do I have to come after you?"

Seconds later the knotted drape she had used before swayed down into sight, I grasped it to steady it. Her bare legs followed, and now her voice came to me with a sweet mockery:

"Never let it be said that Carna required a lover to climb to her window! Rather let it be said that passion made Carna risk . . ."

Overhead another of the terrible blasts of flame blazed across the sky. The light blazed all about us, and Carna leaped from the window ledge into my arms even as the concussion struck at us. I lost my balance; we fell to the floor together . . . and her voice went calmly, mockingly on, loud in the sudden ensuing silence:

" . . . death itself to be at her lover's side! And it sounds as if we both risked death this night!"

I lay there staring into those mysterious depths of her strange wide-spaced eyes, and she giggled a little. I could not help laughing. Even as I struggled to retain sense an almost hysterical laugh of relief broke from me.

We got to our feet, and in spite of the terrible danger, our arms kept hold of each other, our eyes still held together, and our lips were drawn together and burned there for minutes.

"This is madness, woman, we must get out of here. The Croen has made bombs for the prince's ships. He has rebelled against the Jivros, released the Croen, Cyane, they will blast this place, perhaps the whole city, before this night is over!"

"So no one placed any value on the life or the help of Carna but the earth man! Why did you come here for me, Carl?"

"I saw your scarf at the window. I learned then what I did not know before—I could not let you die! Do you know what I felt when I knew you were still in this prison?"

"Of course I know. You see, Carl, the magic of the Zoorphs is really a magic of love. You love me, and I willed it so. You will always love me now!"

I was not entranced by her words.

"We have no time for a discussion of metaphysics or of love, woman. Come, we must get out."

Carna gestured toward the doorway. I whirled, stood frozen with startled nerves. There stood the old Jivro whom I had met in the council beside the queen. In his hands were no weapons, and at his back were no tall Schree guards. I wondered if the desertion of the Jivros had been so complete. Even as I stooped to retrieve the heavy rifle

from the floor, his hands gestured, and the rifle eluded my reach, seeming to glide across the floor. I followed it, and he gestured again.

Some force seemed to freeze me. It had not been nerves that held me before, I learned, but his eyes upon me! Unwinking, the ancient master of what worlds unknown to me, regarded me, and I knew I was helpless before the power he controlled. My lips moved, but no sound came out.

A sudden blast of light came from the window, and the vast concussion shook the building terribly. For an instant I felt freedom in my limbs. I tugged out the .45 at my belt, leveled it, fired. The Old One staggered, his eyes blazed at me, and his hand gestured again. The gun fell from my hands, and some terrible black thing struck into my brain, tearing, rending. I fell forward into blackness . . .

* * *

SWIRLING nothingness, a dry cackling as of some dead-as-dust thing laughing at life itself, a shuddering vibrance flooding through my flesh in waves of terrible nausea, a dim glow that grew and grew into terrifying painful brilliance, then paled and died again into the swirling blankness that was not death, but a knowledge of deep injury . . .

Again and again the swirling horror of my brain slowed, almost stopped. My eyes almost opened into the painful light, and the deep interior vibrating sensation swelled into overpowering violence. I sank again into darkness. Over and over I struggled almost to the doors of consciousness, only to be shoved back by the consciously controlled exterior force.

At last the sickness passed, and my mind quieted. I struggled into wakefulness. As I opened my eyes, the face of the old Jivro gaped with its noseless,

bulging eyes not a foot away, the thin, wide lips and mouth hanging open like a trap, the ridges across the mouth like a fish, white and horrible.

I retched at the repellent sight, and the mouth moved, the words came out so strangely, like a mechanical voice:

"Tell me, earthman, how is the weapon with which you shot my men on the roof made? What are the details of its construction, and the formula for its explosive?"

I almost laughed.

"You are ridiculous, old insect! Such things are known only to technicians in factories, not to mining men like myself."

Again the blinding light struck at me, the sickening shaking of the vibrance welled through me. I sank and was raised again to consciousness.

Still the same foolish old insect face, the same bulging ignorant eyes. The words:

"Tell, then, how this Croen and the forces of Prince Genner may be overcome? Speak, earthman."

The compulsion moved me, and I answered:

"There is no way you can overcome them, Jivro. You are doomed, and there is no hope for your tyranny over the Schrees to continue. They have tired of the Jivros, and you deserve what you are going to get."

Again the sickening application of force and again the exterior compulsion to speak. I said:

"Your only chance to get back power is to get forces from your home in space, wherever that may be. You cannot overcome these fighting men and their weapons, which are as good as your weapons, for you Jivros have relied for too long upon the Schrees and Shinros for your fighting, and for your thinking too, by the questions you ask. Have you not done any thinking in

your life, that you ask me such silly questions?"

A change came over the old creature. I knew he was wounded, for I had seen the glistening milky fluid pouring from the wound in his breast. He leaned weakly against the table to which I was strapped, his eyes on mine glazing over with death. The wide lips at the very bottom of the flat face, moved:

"The Jivro Empire is ending, I think, earthman. We dug our own grave when we relegated all unpleasant duties to our conquered races. For an age the Jivro has been a creature shunning all work and effort, even thinking. We were bound to lose our grip. I see now that I am really foolish, and not a strong being of intellect. Our doom is written, and the day of the writing was that day when we conquered and enslaved the Schrees."

"Now you are talking sense, Old One. You see what is plain to all others; at last it becomes clear to you. But you are dying, and it is too late for wisdom to come to the Jivros. Once you set your feet on the path to greatness; but when you did evil, your feet naturally turned to the downward path of decadence. Evil is not a way of life, it is a way of death."

The bulging eyes on mine flickered with a fierce inner fire for an instant, then the head bent lower. For an instant he tottered there beside me, then crashed to the floor with a sound like a bundle of dry sticks.

I TURNED my head, saw that I was in the chamber of my first interrogation, and the sound of feet about me was the Jivro "doctors," moving to carry away their ruler. I saw the sleek body of Carna on a table but a dozen feet away. Three of the tall white-robed insects bent over her, one moving a control in a great lamp device, an-

other scribbling on a pad, and the third was speaking. Evidently the Zoorph was getting the third degree, too. I lay back weakly. I felt as if I had been through a washing machine and some of my buttons left in the wringer.

As I closed my eyes, a vast *boom* crashed into my ears, the table jumped beneath me, pieces of masonry fell bounding on the floor and I raised my head, staring wildly. Evidently the prince and the Croen were still bombing the place.

I tugged at the straps on my wrists and ankles. They gave a little. I kept on tugging, turning my head as far as I could to see how the insect men were taking their bombardment. They stood, near fifty of them, in a group by the door. Evidently they had started to run out when the crash came, but had stopped when it was evident the roof was going to remain intact. If those things had any sense they would be in the deepest sub-basement they could find, I figured. The Schrees must have been carrying them as helpless parasites for too many centuries to realize they could do without them, for them to be so inept.

Straining my neck, I watched the grotesque high-breasted white figures about the doorway, they were tittering to each other in some tongue I did not know, a strange sound like the rasping of corn husks under squeaking wagon wheels. Suddenly the whole palace shook terribly, the floor seemed to reel, an unbearable sound raged at my ears. I cringed from the pain of the sound. When I opened my eyes, the whole mass of the Jivro medicals was jammed in the doorway, struggling to get over each other, and the squeaking and rasping increased into a bedlam of sound. I laughed, a deep "ha ha," and from the neighboring table Carna cried:

"See what wonderful creatures are the tyrants when things are not going their way. If I had known they were like that in war, I would have killed them all myself long, long, ago. I would have poisoned them, and when they asked me who did it, I would have said, *boo* and they would all have run away and hid!"

As the last of them got through the door, I gave my loosened straps one mighty pull, and the heavy leather tore. I could hear it part in the sudden silence. Again and again I strained, and at last the leather parted entirely. My right hand was free. Feverishly I tore at the other fastenings. There could be but little time left us before that bombing struck dead center and brought the whole palace down. We had to get out. I knew it quite as well as those fleeing insect men.

Free at last, I rolled off the table, landed on all fours, leaped to Carna's side, and released the buckles of the straps. As she sat up, her face level with mine, she pursed her lips, and I gave her a hearty smack. As her arms went about my neck, I picked her up, raced through the doorway, along the passage, down the ramps. I was weaponless, but I had no longer any fear of the Jivros. I saw a group of them busy in a big chamber as I passed, but I raced on, spinning around the next corner, down the ramps and on . . . on . . . until I felt the coolness of fresh air ahead, ran out beneath the stars again, and along the shadowed street.

Putting my Zoorph back on her feet, we raced toward that breach in the wall. Over our heads the great blasting explosions went on, and I saw but three of the circling disks left to the defense of the city.

Outside the city wall we stopped to catch our breath, leaning against the

wall in the shadow.

Carna said, musingly: "It is all over for the ancient Empire of the Jivros, if help does not come for them tonight. For, now that they are seen to be so helpless without their slaves and their fighting men, the news will spread. Planet after planet will rise against them. This is their finish!"

"They expected to conquer earth, Carna. They could never have done it. For a little while, perhaps, but not for long."

"They might have! They are like ants; they have a highly developed pattern of activity. But when that pattern is disrupted, they are lost. They do not think—they remember."

"WE'VE got to make contact with the queen and with Genner and the Croen. We will be left out of things." I was wondering what Carna's future plans were.

"You are interested in the beautiful sister of the Prince?" asked Carna.

"You are interested in the so handsome Prince?" I answered in the same tone of voice.

"Of course, what woman would not be! But I am more interested in you, for I fell in love with you. But I can fall out again, and maybe—who knows . . ." she laughed.

"What's more to the point, Carna, is she interested in me?"

"I could tell you," said Carna, her eyes mysterious on my own, luminous and huge in the darkness.

"Well, perhaps you had better tell me, then."

"Why? I love you!"

"You mean she *is* interested in me!"

"Very much, and she is a very smart woman who has ways of getting what she wants. I am very much afraid she will take you, with her to space when they go, and leave poor Carna in her

ruined city, with no one but the wild beasts and the dead bodies. This will be the end of this place."

"You are wrong!" I smiled, thinking the girl was flattering me.

"No, not wrong, dear earthman. I am very much afraid of the future, for I am to lose you, but I have a way of avoiding that."

"And what is that way?"

"You will find out when the time comes, and you may like it very much!"

"Let's get away from this wall where we can see what's going on. . ."

We plodded across the level, grassy valley floor, walking backward some of the time, watching the great circling ships above the city's center, and the lancing blue paths of their rays stabbing at some darting adversary high above them.

Then from the western sky came a series of round low shapes, speeding so rapidly the eye could hardly distinguish them from the darkly glowing horizon. After their passage, in a close series, came the air-scream of falling missiles, high-pitched, then came a terrific cannonading of explosions. Fountains of fire sprang up in exact sequence, one after the other. The ground shook and shook underfoot, each shock seeming greater, to add its strength to the one preceding it. I knew that this was for the Jivros the end of their plans on earth.

Simultaneous with the arrow-swift flight, two great blazing lances of blue fire shot downward from the ships far overhead, transfixing the circling spheres one after the other. They tilted, plunged slowly, faster and faster—ended in great splashes of fire and sound somewhere in the city below.

I mopped my face. The night was hot, and relief flooded me.

"We got out of there just in time,

Miss Mystic!"

She nodded, her white smile in the night a beautiful thing.

"What is this Miss Mystic word you use?"

"It means Zoorph, Carna. It is U.S.A. speech."

"U.S.A. speech," she parroted. "Some day I will talk U.S.A. speech, too, like you!"

"I hope so. This tongue of yours gives me cramps in the jaws."

We plodded on across the grass, heading for the cliff ledge where we had met. I knew no where else to go.

Quite suddenly came a soft sussuration overhead, a light-beam lanced down, pinning us there. I tossed Carna aside, rolled myself out of the path of light. But mercilessly the light beam spread, until we were again within the circle of illumination.

But no blue death ray followed. The dark shape settled to the earth beside us, and the door in the side opened.

I sprang to my feet in glad surprise to see Holaf in the round doorway, motioning us to enter. He cried:

"Come, the day of the Jivro has ended, there is work now for men to do!"

CARNA laughed happily, ran to the doorway, and as Holaf caught her waist and swung her up, she kissed him on the cheek, still laughing in abandoned joy to know that finally the centuries-long nightmare fastened on her people was ended. I followed more sedately, wondering what now? I thought of poor cross-eyed Jake Barto, and of the three fortune-hunters who had gone the same path—and as I shook Holaf's hand, questioned the ecstatic confidence of release upon his face.

"Suppose the Empire sends ships here, will they not destroy all you have

gained? Why do you feel so sure their power is broken? They were but few here?"

"They will not send ships, for no messenger got away. What do you think the ships of the prince have been doing? This is the beginning of their end!"

"How did you get out of the palace? The last I saw you, you were storming the place, gun in hand, and cheering . . ."

"When the bombs began to burst against the very roof, I got out. I killed a few Jivros first, though! It has been a good time; the best of my life!"

"Were you picked up as you picked us up?"

"Of course. Look there who it is that has done us the honor . . ."

My eyes followed his finger pointing through the far arched doorway to the control room. At the bank of levers and dials, her face intent upon the scene through the circular plastic dome, sat Wananda. Inadvertently my eyes went to Carna's face; she nodded once, vigorously. I knew she meant:

"See, I have told you the truth. She knew where you were, her heart told her, who else would descend to pick you up while the fighting was still going on?"

I went to her, and stood for a moment beside her, watching her swift hands, the light on her midnight hair, the delicate superb chiseling of her forehead and nose, the exquisite aura of womanhood about her—she was every inch a queen.

She turned, startled to find me there, then smiled, and a warm flush spread slowly from her neck upward to her temples. She knew that I knew! She laughed a little quiet sound to herself.

"That is why the Zoorphs are hated, earthman. One can never keep a secret!"

"You must have the powers of Carna yourself, to know that she told me." I answered.

"I have studied their methods. One comes by such talents hereditarily. The Zoorph is only an organization which concentrates on taking in and teaching such gifted children. I, as a princess, had a tutor of their sect. I know that you love her, too, you know."

"And not yourself. But she confesses that I love her only because of her skill at hypnosis, or something of the kind. To me that seems unfair, but I cannot help it. I love her, though I am drawn to you. But why should we concern ourselves with these matters? You will go back to space with your ships to carry rebellion to the other Jivro strongholds. I will be left behind to mourn you both."

"Why should you be left behind? Do you find the Schree or the Zerv company so repellent?"

"Not at all. I should desire nothing more than to see the worlds of other suns, other places in the far paths of space. Yet . . ."

"Yet what? Have you a wife here, children?"

"No, not that. But I have possessions it cost me many years of effort to acquire."

Carna came silently into the room, stood on the other side of the queen. For an instant Wananda closed her eyes, and some subtle sense of my own told me they were talking with each other in a way I could not hear. Wananda opened her eyes, turned to me, smiling whimsically.

"Carna suggests that she will give your love to me in return for a certain favor."

"Do you want my love, Wananda?" I asked softly.

She did not stop smiling secretly to some sound she heard and I did not.

"You see, earthman, our race has never developed the morals and inhibitions which your people find so necessary. We are polygamous, and not apt to be jealous. She offers to give you to me as a royal husband in return for the privilege of being your slave, your housekeeper, your body-servant as it were. What do you say?"

I WAS stunned. So openly to be bargained over; frankly to be invited to marriage, to two women at the same time! Weakly I countered:

"Your people would object to an alien consort!"

"The word is strange to me. Among us you would be a ruler if you married me. Among us all men have several wives. But women have but one husband."

"You are offering me the rule of the Schrees?"

"Yes, and if our coming war with the Jivro creatures turns out well, it will mean not one planet, but many. I cannot say how many, as some of those never allied with the Schrees before will naturally gravitate to us in gratitude for our releasing them from the Jivros. I am agreeable mainly because I know that we need your earth science, your different culture—as wedded to our own science we would be invincible. We will need everything finally to conquer the ancient ingrown tyranny of the Jivros. I am not offering you exactly any bed of roses. Besides, I like and trust Carna. I can understand why she loves you, and why she bargains for any part of you. She knows I have but to exert my own wisdom of Zoorph to release you from her hold on you."

"I see. Let me get this straight. You love me; it is agreeable to you that I continue to love Carna; but I will love you too. Two wives who love me, a kingdom, and the chance of knocking

over a whole empire of insects who have parasitized human races in space and meant to do it here. There is no way I can refuse!"

Carna laughed.

"With two of us working your mind for you, how could you refuse?"

Wananda frowned at Carna's frankness.

"It is stated in the nineteenth law of Zoorph code that no victim is ever to be told of his enslavement openly, Carna. Why do you break the law?"

"I don't know, Wananda Highest. I think it is because I want to be fair to him, and give him a chance to do his own thinking, too."

I grinned.

"Our race has long been familiar with your so-called magic, dear ones. We call it hypnotism, and if you think I cannot resist it, remember that I shot the Old One with his eyes upon me."

Wananda suddenly set the big lever she held into a notch, turned to me, her face full of a charming surprise which I yet knew was an act.

"So you think you can resist your wives' wills, do you, earthman? Come, Carna, let us humble his boasts once and for all!"

Their two lovely faces pressed cheek to cheek, the two pair of eyes bored into my own, and four quick slim hands gestured about my chin. A dizzy enervation swam into me as though I were bleeding to death, as though honey and whiskey were being poured down my throat, as though I had fallen suddenly onto a pink cloud of spun candy.

Visions of terrific pleasure began to hum in my head, my knees gradually gave way beneath me, until I was on my knees before the two women. My hands were unconsciously extended as if to fend them off, and each of them seized a hand, pulled me to the round bench at the back of the control cabin.

They stroked my cheeks, began to murmur their "magical" phrases in their mysterious mystic secret words, and my wits began to float into a very genuine paradise where their two faces, side by side, became flower and fruit and tree and earth itself.

* * *

WHEN I awoke from the dream into which they had sent me, Carna was seated beside me, nodding sleepily, her head on her chest, and Wananda had returned to the controls of the ship. As I looked at each of them, I found a *new something had been added!* I loved each of them equally well!

I sat up, stretching. Sometimes it is comforting to have problems decided for one. Now I did not have to go through any excruciating pangs of conscience or guilt or fight myself into a state of not wanting one or the other of them. They had just adjusted me to

the situation mentally, and I felt that everything was perfect in the best of all possible marriages for me!

"Well, I'm getting hungry!" I cried, apropos of nothing except that I did feel pangs.

My Zoorph did not even get up. She reached out one hand to where a covered tray sat on the bench beside her, and handed it to me. I took off the lid, and on it were broiled chops, steaming deliciously baked beans, some kind of soft brown bread—fruit, a sweet perfumed wine.

"The master is hungry, Carna will provide!"

If I get cross-eyed as Jake Barto, it will be from trying to see two women at once.

Oh yes, I forgot to tell you that Nokomee became the prince's third wife. I wished her happiness. For me, two are enough!

THE END

MATHEMATICAL STONE



By R. DEE



IT IS not easy to arbitrarily divide mathematics into branches, because the subject is so interwoven and so interlinked. Never the less it is the custom. Of the main branches of the subject we think of algebra as the basic tool along with arithmetic which is really a tiny part of algebra.

Geometry which concerns itself with physical shapes is blended with algebra to give analytic geometry, a combination of symbols and physical configurations. Trigonometry too is a blend of algebra and geometry. Now take all these subjects, mix them together and add a number of other concepts and you get the mathematics known as the *calculus*. The name merely comes from *calculi*—Latin for stones—and having reference to the fact that primitive reckoning was often done with pebbles. As everyone knows the calculus is the main tool of engineers in every applied science. One is inclined to ask, just what does the calculus do that makes it so necessary in engineering science?

The answer is not difficult to give. For one thing it is the subject concerned with rates, with speeds—those very important factors in engineer-

ing. Analytic geometry is capable of showing us a picture of a given relationship between two quantities but in itself it—the graph—is unable to answer how fast one quantity is changing with respect to another. And to know what is important. The relatively simple idea of determining the rates of change of a quantity with respect to another by measuring the slope of the tangent line to the graphical curve is apparently simple to a genius. Sir Isaac Newton and Leibnitz were such geniuses.

The measurement of the area under a curve was another example of the inverse of the above. These two concepts together constitute the heart of that oft abstruse subject, the calculus. Like anything, once it's known, it seems easy, but it took geniuses to make the step. It is generally agreed though, that even if Newton and Leibnitz had not applied their genius to the subject, it would have blossomed from the brains of others because the air of the time was ripe for the discovery or invention.

Calculus then answers the questions, how fast?, at what rate?, what area beneath the curve? and so on. It is the heart of modern engineering.

CAR OF THE FUTURE



By R. LEAVITT



THE expression "car of the future" has been used by every advertising man who ever wrote a word of high pressure copy, but usually it hasn't meant a great deal. Is it possible though, to get some idea of what cars in the not too distant future will be like, judging from what we know now? Yes, it seems so.

First, the exterior of the car is not likely to change so radically. We have reached the limit in stream-lining an automobile with the exception of the tear-drop shape and past experience has shown that the public apparently isn't too interested in that. Furthermore in terms of functional design, such severe streamlining is neither desirable nor necessary. An automobile doesn't go fast enough to require the outlines of a rocket—and a square chunky car is usually a lot roomier and stronger than a slim cigar.

Another phase of the new car of the future will be the safety factors inherent in good design. For one thing the frame will be all-welded in a unit and of extreme strength in an effort to cut down the tragic numbers of deaths that devastate the country every year. The interior of the car will be suitably padded with thin sheet metal and foam rubber, and all projections from knobs and instruments will be eliminated. Already this is being done on current models. The introduction of a collapsible steering wheel is another highly desirable feature to be added to American cars.

So much for those features. Now for the heart of the automobile—the heart and the brain—the engine and the brakes. The brakes of course will be greatly improved by using disc type friction

surfaces. When it is realized that the brakes have to absorb oftentimes many hundred horsepower, it is easy to understand why they should be of the best design possible. And this too is being worked toward.

The engine for a while will still be the reciprocating high-compression type, with the compression ratio being shoved up. But until we get away from this type of engine, an automobile will still be a bothersome gadget. A rotary engine of some kind, like a gas turbine, is the ideal solution if liquid fuels are still to be used.

If as much energy had been devoted to the steam car as has been devoted to the gasoline car, it would undoubtedly be a much superior job today. The steam turbine could be incorporated in the automobile—and it is ideal! Someday this may be done. As a matter of fact, some private experimenters have made their own steam cars using the steam turbine, with great success. In Germany before the war, as well as in the rest of Europe, some very excellent truck and bus engines of the steam turbine type were being manufactured.

Of course when the electric storage capacitor of several hundreds of kilowatt hours is finally invented, then the supreme type of motor will enter the picture—the electric motor. This has no peer nor any superior.

Until all these things come about, we'll have to be contented with our reliable but troublesome reciprocating Otto engines. They're dirty, inefficient, require elaborate care, and are too complicated—but they run!

"THE TIME IS OUT OF JOINT . . ."



By I. MISSER



"THE time is out of joint, O cursed spite that I was ever born to set it right . . ." From time to time it has been the habit of this magazine to pass judgment on films of interest to the lover of fantasy. Sir Laurence Olivier's *Hamlet* is such a film, designed for the appreciation of connoisseurs of fantasy as well as of literature and the theatre.

As everyone knows, the play is primarily a psychological study of a man, "who," as Olivier sonorously informs us in the beginning of the film, "couldn't make up his mind." The play is filmed in black and white to suggest the tremendous, dark emotional implications of the study. The costumes do not follow an exact pattern of a given period—vaguely they are medieval. The setting is of

course, Elsinore, that grim and gloomy castle in Denmark. It is here that the fantasy lover begins to see the superb technique in this film.

Elsinore is a vast, empty, gloomy, tomb-like structure, studded with posterns and towers, furrowed with dark halls, suggestive of horror and tragedy. The castle borders the sea, and Olivier has it wreathed in fog and shadow. The whole suggests some never-never land.

The Ghost, Hamlet's father is a marvel of mysteriousness, a brooding grim spectre haunting his, son. Photographically he, is magnificently done. One can almost believe in his reality. The fencing scenes are extraordinary in their accuracy and their restraint. The editors of this magazine strongly suggest you see the film if at all possible.



SCIENTIFIC ODDITIES

By LYNN STANDISH

GROUND HOG

THE technique of drawing heat from the ground is now commercially available. Some time ago this magazine reported that experimental work was being done on such a process using what amounts to an inverted refrigerating cycle. Well it is now possible to buy complete units for the home. Of course for best results the home should be engineered around such an installation—but it can be used otherwise. Okay, curl up and relax—like the groundhog, man is going to the earth for warmth.

The principle involved was simply burying deep in the ground the cold coils of a refrigerating machine. This takes heat from the ground and through the regular cycle delivers it to warm coils in the home. In the summertime it is possible to reverse the cycle thus making the machine act as an air-conditioning apparatus.

The present installations are quite expensive running in the neighborhood of two to three thousand dollars for the small and medium small home—but these prices will probably come down. Furthermore, the cost of electricity restricts the general use of this too. But it's here, that's for sure!

FROM COAL TO COLOGNE

ONE lump of coal can make a better perfume than a bouquet of lily-of-the-valley.

It is apparently impossible to produce certain scents by extracting it from flowers. The essence, or natural oil of the flower is much too delicate to survive the extraction process. But chemists have been able to compound the desired fragrances by the use of coal tar. At one time it took about twenty-five tons of violets to produce one ounce of the natural oil, and a ton of roses offered only ten ounces of rose oil. Lilacs gave nothing and that scent was unobtainable. Now chemists are able to synthesize all these scents and many more not found in Nature.

PICTURES IN GLASS

MOST of our photographs are made by using a light-sensitive emulsion of silver compounds spread on the surface of paper, plastic, or glass. Recently a new method for

making pictures within the glass was discovered. Our old type photographs are easily scratched and they fade out with age. The new way in the photography field is to mix small particles of metal in the glass. Unlike ordinary photographic plates, this glass is only sensitive to ultraviolet light, and does not need to be kept in the dark. The new way is to cover the metal filled glass with an ordinary photographic negative and expose it to ultraviolet light. The glass becomes heated and the picture appears within the glass. The glass does not have to be flat. It can be a vase, table-ware, or jewelry. It can also be tinted.

SLEEP LEARNERS

THE method of learning while asleep through the medium of a phonograph is no novelty—at least in conception. In many science-fiction stories this theme has been used again and again. The method consists of absorbing knowledge while asleep by having a phonograph repeat something continuously.

While this has been a matter of fiction up until now, it has at long last taken its rightful place in fact. A prominent teacher of languages by the phonographic method has conducted some experiments with students. He put the students to sleep. Buried under their pillows were small headphones, just barely audible. From an automatic phonograph at the side of the bed, bits of knowledge were poured into the headphones. The next day the students were tested. A separate group who had learned the knowledge while awake was also tested.

Astoundingly enough, those students who had been exposed to the phonograph while asleep did exceedingly well! Much better than the students who had not. It is believed now that some mysterious subconscious channel of the mind, absorbs this learning even while the conscious mind is sound asleep.

Imagine what this can mean for the future! It is possible that men studying for the most abstruse examinations, will be able to do so while sound asleep, and will be assured of assimilating the knowledge so sugar-spooned to them.

Languages seem an especially good bet for this. Excuse me, I'm going to go to sleep. I need a lot of sleep. I want to learn to speak Spanish!

SEVEN AT ONE STROKE!

LIKE the mighty little tailor who slew the seven (flies) at one stroke of his sword, the modern multiplying phototube does the same. In this case it does even better. Radio technicians and scientists have always been bothered with an electronic phenomenon known as secondary emission. This occurs in radio tubes when an electron strikes any part of the tube it causes more electrons to be released. Now scientists have harnessed this effect.

In a photo-electric tube the cathode gives off numbers of electrons in accordance with the strength of the incident light. Weak light—few electrons. In order to get a lot of electrons with weak light the secondary emission effects are used. A lot of auxiliary cathodes are arranged inside the phototube, so that, when light falls on the cathode, the electrons which are released, strike other cathodes and release still more. Since there are nine additional cathodes, the multiplying effect is tremendous!

What might start out as one electron ends up as an electric current of millions of electrons. This ingenious technique has made the phototube a very sensitive device indeed. It is so characteristic of science—what was once a great flaw is now turned into a great advantage.

I OR O

THE design, in mechanical engineering, of various structural shapes is now pretty well understood. In fact, most modern design, involving steel framework construction has been reduced from a calculating science to a matter of hand and rule book reference.

Sometimes students are confused when they hear statements like, "a tube is the strongest shaped form." Then they look around and everywhere they see I-beams, angle-irons etc. The confusion here is very simple. It comes from the fact that a tube is the strongest shaped form of *any simple element*. Thus an I-beam is stronger, but it is no longer a simple element. A tube however is stronger than a rectangular beam. It can be noticed that an I-beam is a very logically designed construction piece. First there is a vertical web which in effect is simply a beam of enormous thickness. Such a beam by itself would flex laterally and break under any load. But in an I-beam the horizontal member prevents this flexure, giving a structure of extreme strength.

It will be noted too that a rail is really nothing more than an I-beam of a slightly varied shape. The top piece is thick and asymmetric because it performs the function of not only carrying the load but of directing and guiding the wheel as well. The bottom piece is thin and flat, being designed to rest on a relatively softer surface—the ties—without biting into them. The vertical portion of the rail is essentially the supporting part of the I-beam.

It is apparent that the tube, or pipe or cylinder plays an enormously important role in construction as well as the I-beam. Often where loads are not as great, a pipe may replace an I-beam.

The angle-iron or L-beam is much used for this smaller sort of construction. Here too loads are not so great as to warrant an I-beam, yet a considerable amount of strength and rigidity is needed. The angle-iron or L-beam plays its role in such spots.

The rectangular beam when suitably braced is a strong structure too. Witness most modern automobile frames. These are subject to considerable stress. A box-type frame provides here a structure of adequate strength though not the equal of an I-beam. The box structure has the advantage however, of permitting many other objects and parts to be tied to it.

The development of the modern aircraft has had a great deal to do with the study of structural shapes. The "stressed-skin" feature is particularly noteworthy. Here the outer covering or skin is rigidly tied to the frame, the whole then stressed so as to distribute strains at any one point over the whole structure, preventing dangerous concentrations of strain.

The whole aircraft in effect becomes a single structure. This practice is being followed to some extent in new automobile design, but only as far as the frame-work. The surfaces and skin usually remain independent not only because the stresses in a car are not as great, but also because repairs are facilitated when the skin is not part of the frame.

SCIENCE—FICTION?

WE HAVE received numerous favorable comments on a type of story that has invaded science-fiction in the last few years, and which has appeared from time to time in this magazine. We refer to the science fiction story based on extrapolation, that is to say, one which, in light of present day scientific knowledge, is moderately plausible. It is understood of course that the straight science-fiction story which disregards science is equally valuable and as entertaining. Yet science—applied science—has jumped ahead so fast in recent years, that it is often a pleasure to predict what will happen in the next few, with the realization that what is said is far from fantastic, but in all likelihood, probable.

A number of stories have been presented which use the age old theme of Interplanetary travel. Now this is of course, nothing new. In fact, it is the backbone of science-fiction. But these stories we are referring to, have an added quality which makes them really extrapolations of what is known now. Other the stories utilize no element of fantasy whatsoever except the existence of a mysterious rocket fuel—as yet undiscovered—which enable the rocket to penetrate space. The remainder of the story sticks strictly to scientific

fact, in regard to astrogation, space suits, behavior inside a rocket, renewal of air supply and so on.

And in a way this is extremely entertaining for while we know we are reading fiction, we also are aware of the fact that it is likely to be true before many years are past. Some of the bigger "slick" magazines, have favored this new treatment of science-fiction and have used such stories. It's there we have the laugh on them—they usually imply that it has never been done before—when we've been doing it right along. For many modern readers of *s-f*, a ray-gun and a disintegrator with atomic-reglugulators, are not enough. For this type of reader in particular and the other readers in general, we have tended to give this type of story a chance.

ROCKET THRUST

HORSEPOWER, and other technical words used to describe and calculate with on conventional engines, do not have much meaning when talking about rockets. The most important word in rocket terminology is "thrust." Thrust is a measure of the propelling effect of a rocket.

Supposing a rocket much like the famous V-2 weighs ten tons which is approximately what that rocket does weigh. In order for it to hover just off the ground, balancing itself on its exhaust jet, it must exert a rearward thrust just equal to its weight—actually a slight bit more. Thus the rocket is, we say, exerting a thrust of ten tons. Obviously this thrust is just neutralizing its weight, just balancing out gravity. In order for it to rise, it must exert more thrust.

If it offers a thrust of twenty tons, twice as much as before, ten-tons of the thrust balance out gravity while the remaining ten tons offer to propel the rocket upward. In terms of horsepower it is amazing what this thrust amounts to. Each pound of thrust when exerted at a measured velocity of about 360 miles per hour, equals one horsepower! That means that if the rocket were traveling at 360 miles per hour and pushing with a ten ton thrust, its motor would be developing 20,000 horsepower!

Identical computations may be made—must be made—for jets. Thus jet engines, like rocket engines consume fuel at a tremendous rate and develop gigantic amounts of horsepower. And this is only the beginning of the Rocket Age!

HEATING—INSIDE OUT!

THE application of induction heating is advancing in leaps and bounds. Wherever heat can be used in an industrial process, induction heating will most certainly fill the bill. Its major advantage is of course, that it puts the heat exactly where it should go—and nowhere else.

Induction heating depends on the relatively simple fact that, if a conducting or non-conducting

substance is placed within the strong electromagnetic field that surrounds a coil or a wire carrying a high-frequency alternating current, that substance will be heated. By designing the current carrying elements to conform to the shape of the object to be heated, it is possible to so localize the distribution of the heat that no other parts of the object will be injured, there will be no waste of energy, and places can be reached that would be inaccessible to any other form of heating.

This internal method of heating has many applications. It is costly of course because it involves the utilization of a high-powered radio transmitter, but because no heat is wasted and you can work from the inside out, for work like hardening gears, pins, and other structural parts, it is the best. In the wood-working industries which formerly relied on heating from the outside, induction heating is paying its way by producing plywoods, furniture and other materials of vastly greater strength. This is, of course, only the beginning. As time goes on the technique will extend itself even to cooking as has been done on a modest scale!

PICTURE TUBE

THE heart of a television set, either the transmitter or the receiver, is the cathode ray tube. This incredibly ingenious invention has made the whole thing possible. The "CRT" is nothing new. It was invented a long time ago, but until the last thirty years, it was not used on a grandiose scale. Prior to this time, it was used primarily as a substitute for the Ballistic Galvanometer, a device for measuring impulsive, transient electric currents. Because a beam of electrons has little inertia, it is capable of following the most complicated phenomena, very accurately.

In the early days of television, technicians looked primarily to mechanical gadgets like the "scanning disk" to accomplish their purposes in television. This was a carry-over from the fact that television seemed to be an optical problem. Later on, it was realized that there was such an intimate relationship between light and electricity that the use of the latter was imperative. Then the cathode ray tube came into service. All camera and receiving tubes are of the CRT type. They may be more or less complicated but they are still CRT's.

An electron gun shoots a beam of electrons at a screen that fluoresces under their impact—and lo!—we have a picture on that screen. The fact that the beam is moved by electric or magnetic fields only serves to indicate the linkage between optics and electricity. The electron microscope, which is a cathode ray tube of a type, also helped in the development of TV. And CRT's are becoming more sensitive. Soon it will be possible to use them in the dark!

"I'VE GOT YOUR NUMBER"

TOWARD the end of the nineteenth century there was a German mathematician by the name of George Cantor, who with all devotees of the sciences and the arts, made this world a more interesting place in which to live, and the fruits of his work have been exceedingly valuable in pure mathematics. By some skillful reasoning, he enabled us to count the uncountable.

He created the arithmetic of Infinity. He assigned a classification to the infinite. It is not our purpose to go into his methods nor their validity; we can only state some of his marvelous results.

You might think that all the numbers, both integers and fractional numbers, are sufficient to describe any numbers we might choose to count. *This is not so!*

For example, the number of geometrical points on a line, or in a square, or in a cube, is larger than the totality of all integers and fractions! Furthermore, this is not the greatest number known. The number of all geometrical curves ranging from the straight line to the most involved curve, is greater than the totality of points mentioned above! Incredible though those statements may seem, they are true and stand the most rigorous analysis. Symbols have been assigned to the above named quantities. Hebrew letters are used. The first letter of the Hebrew alphabet followed by a subscript.

Thus, the totality of integers is Aleph null - a little sub-zero. The totality of points is Aleph sub-one, and the totality of curves is Aleph sub-two. As yet no quantity has been invented or discovered that would require the use of Aleph sub-three.

This is a tempting point to introduce what might amount to a truism. While no use has yet been found for the quantity Aleph sub-three, perhaps it might adequately describe the number of liars in the world or maybe the number of husbands who have proven faithless! At this point too, George Cantor is rolling over in his honored grave.

ELECTRONIC WORLD

IT IS not often that one considers how much the English Language has been changed by technology and modern science. But it is a fact. Within the last thirty or forty years more words have come into existence through the introduction of new technical devices, than in the previous hundreds of years.

Most of these words that are invented to describe new inventions or devices, have a hodge-podge construction, being queer mixtures of Greek and Latin roots modified by English and Teutonic prefixes or suffixes. Engineers and scientists are not usually concerned with the grammatical clarity or soundness of their construction. So long as the word serves to illuminate the product, that is sufficient.

An excellent example of this technique of naming things is given by the word "electronism" and its derivatives, "electronic," etc. Electronic technicians have been looking for a long time for some word to describe the gadgets that they create. "Circuit" and "set-up," while suitable for the lab, really do not indicate the nature of the device because those words are applied to many other branches of technology. Finally some suggested that they consider a word which is used in machine work, "mechanism."

If a mechanism is a machine, or rather a general name for a thing containing machine parts, why not call a gadget containing electronic elements, an "electronism"? And that is what has been done. When engineers make new electronic or electrical devices, they call them "electronisms." A new radar set, or even a radio contains components called "electronisms."

WHAD'YA SAY?

THE Earth is truly covered with a Babel of tongues. It is hard to estimate the numbers of different languages spoken all over the Earth, but they must at least number in the thousands. Generally the average student in our present-day schools becomes familiar at most with one or two modern foreign languages like French, German or Spanish—or Italian. Since all these languages are in reality very similar in basic structure and origin, he gets no picture of how really different languages like Chinese or Swahili are formed.

It is amazing indeed to consider how differently languages may be constructed. We who speak English are naturally, like any speaker of his native tongue, convinced that what we say is said in the simplest fashion possible.

Yet, when we consider Chinese, for example, we see a language which is basically much simpler than our own. True it has a terribly difficult script—ideographic in nature—but the language itself has no grammar! Can you imagine how simple this would be to learn. It has one drawback that can't be remedied however by changing to another script than the pictographic—it depends a great deal on tonal quality.

It has been said that an ideal language would combine the grammatical simplicity of Chinese with the great phonic simplicity of German. German is the most easily understood and the clearest spoken of foreign languages, but its grammar is very complex and archaic. With Chinese, it's the reverse—poor-sounding but very simple grammar structure. The two together would make an excellent single tongue!

MOUNTAIN CLIMBING

MOUNTAIN climbing is fast becoming the world's number one adventure sport, even though it is something new under

the sun. The conquest of the higher peaks began about one hundred years ago in the Alps. In the first ten years nearly every important peak of the Alps was scaled. The nearly impossible Matterhorn was scaled in 1865 by a Britisher named Edward Whymper. He and six companions reached the summit, but as they descended, the rope broke and four of the seven plunged to their death. From the Alps, the mountain climbing fever quickly spread throughout the world. The highest mountain that has been scaled is in the Himalayas—Nanda Devi in Carhwal. This peak which is 26,000 feet high was climbed by an English-American expedition in 1936. Mount Everest has been the scene of seven important attempts since 1921, but no one unless it be Mallory and Irvine, has yet penetrated the final barriers with which mother nature guards the very summit of the world. In 1924, two Englishmen named Mallory and Irvine climbed Mount Everest to a height of 28,400 feet, much higher than man had ever climbed before. It was only 800 more feet to the top of the mountain. From a point below, their companions watched them struggling on toward their goal. Clouds and mist closed in around them, obscuring their view. Mallory and Irvine were never seen again. No one knows whether they reached the top before they died, but we do know that no man has ever climbed to the top of Mount Everest and returned to tell the tale.

An interesting future adventure will be the exploring of Amni Machen, the "mystery mountain" of southwestern China. Many airmen flying the Burma-China hump during the war reported that while flying at 29,000 feet or more, they had to look up to see an enormous uncharted peak. If they were not mistaken, Mount Everest will have to take a back seat as far as height is concerned. Its discovery will rank as one of the leading geographical events of our time, and will offer mountain climbers new lofty worlds to conquer.

DANGER!—HALF A MEGAVOLT

THE advertisements today of a number of the big electrical companies are striking indeed. And they are a confirmation of some information published several years ago by this magazine.

Directly after the war, when teams of American researchers went through what was left of Hitler's Nazi empire, they found the Germans using a transmission line with its associated equipment at five hundred thousand volts! Immediately we dragged out all the information we could and studied the German set-up thoroughly. In the United States, the matter of building half million volt transmission lines had often been discussed, but now, for the first time, with the aid of German data, we set up such an experimental line ourselves.

What is the advantage of using high voltage

lines? Simply this: they enable the cheaper transmission of electricity over greater distances. Furthermore for a given amount of power transmission they require less copper and iron. The difficulty that held up the utilization of higher voltages in transmission lines was the lack of suitable insulators for both the lines and the transformers which have to handle such tremendous voltages.

Now that these things have been overcome we can expect to see monstrous towers dotting the country, with gigantic insulators and long spans of widely spaced conductors. Transformers too will be gigantic. But such development is a tribute to our engineering skill and capabilities for though the Germans initiated the practice we are the ones to put it into large scale operation.

Westinghouse first announced this American project but it is likely that many other firms had a hand in its application. The insulators for such voltages are tremendous, being many times the size of those used on our conventional two hundred and seventy-five thousand volt installations, hitherto the highest.

THE DRUNKEN MATHEMATICIAN

D R. GEORGE GAMOW'S delightful book, "One, Two, Three . . . Infinity," contains some very interesting material on the "laws" of chance and probability. One problem of particular interest seems to have been the creation of a drunken mathematician. In actuality it is a clever illustration of the law of probability.

The problem begins with considering a drunk leaning against a lamp post in the middle of a large square (so that he doesn't stumble). Then as is so common with drunks, he decides to go somewhere, anywhere, and he starts to move away from the lamp post taking steps at random, in an absolutely unpredictable manner. First he moves away from the lamp post, then he staggers right, then he staggers ahead, then back to the post and so on. Now the question is, is there any way we can predict how far away he'll be from the lamp post at the end of one hundred steps assuming of course that he moves completely at random?

At first guess this would seem impossible to answer. But it isn't. There is a very definite answer which is all linked up with the mathematics of chance. It is a problem similar to that encountered in the motion of gas molecules.

The answer is that the drunk would most probably be about ten yards away from the lamp post, assuming that he takes an average step of one yard! The mathematics involved here, while not too difficult is not easy to illustrate.

Because this is a discussion of probability, it is of course possible that the drunk *might* walk in a straight line, but it is extremely unlikely.

In physics, substitute gas molecules or Brownian particles for the drunk and you have a pro-

found study to contend with. You see, when dealing with small aggregates, other laws of probability do not tell us much. But when we deal with thousands or millions or billions, it's another story. If you doubt that, just ask the insurance companies. Contrary to popular belief, their business, is, in a sense, gambling of the highest order.

IDIOTIC MATH

WHEN the famous philosopher and mathematician, Bertrand Russell said, "mathematics is the science in which one never knows what one is talking about, nor why" (roughly paraphrased), he wasn't far from wrong. But mathematicians have had some very funny ideas about their art. Strictly speaking, pure mathematics demands exacting proof and elaborate reasoning. Oftentimes, because of the failure of a proof in advanced mathematics, the whole subject will be thrown out. And that's bad.

There was an eminent English electrical engineer by the name of Sir Oliver Heaviside—no relation to the Heaviside layer—whose hobby and passion was mathematics. In his work in power engineering—the building and design of electrical power plants—he ran into some knotty mathematical trouble which conventional mathematics failed to provide a solution to. So he went ahead and invented a mathematical system of his own. This system was ingenious and miracle of miracles—it worked!

When the paper was presented to the engineers they found Sir Oliver Heaviside's "Operational Calculus" as it was called, of inestimable value. It provided the answer to many difficult problems in the engineering of transmission lines, which would have gone unsolved but for him. Heaviside's Operational Calculus finally came to the attention of the mathematicians. When they saw what had been done, they descended upon the subject hammer and tongs, and they proceeded to tear it apart. It wasn't rigorous, they said. It does not conform to known mathematical systems. They forgot one thing. It worked! That was the only answer Heaviside gave them. It worked. Subsequent study of the subject, has made it more rigorous, and it has been modified considerably—by mathematicians who have seen the light. Now it is a part of every good electrical engineer's mathematical tools.

The same case might be made for Gauss's invention of imaginary numbers and Steiner's application of them to electrical engineering. Now no one thinks twice about using them. The square root of minus one has been tamed.

It is possible to see this application of a subject without thorough understanding of it, everywhere. Look at the average child—or adult for that matter. What does he know of number theory? What does he know of mathematical rigor? What does he know of proof? The answer is nothing—nothing at all—but they're quite able to do all

the arithmetic necessary for their work. You don't have to know a lot of theory to do perfectly acceptable work. If we had to wait until we knew everything theoretically—nothing would be done. Let's get to work.

TOUGH STUFF—QUARTZ

PURE silicon dioxide—known to the trade as "sand"—is indeed a marvelous stuff. More and more uses are being found for this natural glass. Silicon dioxide is used in all glass to a certain extent, but it is in the pure state that it really shows its stuff. For one thing it is possible to take white hot fused quartz, insert it in a stream of ice cold water and the material will not crack. As a consequence, it is much in demand in the laboratory for glassware. Because it is hard to work in large volumes at high temperatures, it is generally restricted to smaller chemical apparatus.

Its other amazing property, an extremely low coefficient of expansion gives it some other unique uses—this coupled with the fact that it is attacked by very few chemicals except fluorine and basic compounds like the hydroxide.

The low expansion of the material makes it perfect for optical apparatus, and it was originally chosen for the two hundred inch mirror—but try casting tons and tons of fused quartz! Our present technology isn't quite up to it yet. But for smaller optical equipment it works fine and it is being used.

It has some amazing physical properties in addition to those named above. Because it can be made into very fine springs whose elastic constants are unchangeable it is much used for extremely delicate balances for weighing substance. These balances are nothing but helical springs made of fused quartz supported in a container and calibrated with minute weights. The resultant scales can measure millionths or less of a gram!

Quartz is tough and is used for portholes that are subjected to either heat or pressure or both. Thus the Bathysphere at the bottom of the sea, used quartz windows. Furnaces often have quartz windows. And a piece of fused quartz has been used as a window in an automobile engine in order that a camera might photograph the resultant explosions within. Fused quartz must be worked at very high temperatures. This is its big drawback—though sometimes an advantage. A terrific needle flame of oxygen and hydrogen plays against the quartz and a skilled glassblower, his eyes heavily shielded against the brilliant light, manipulates it as he would taffy.

Fused quartz is able to transmit ultra-violet light unlike ordinary glass so lamps for this purpose employ quartz envelopes. Mercury vapor lamps of tiny quartz tubes may be operating at seven hundred and fifty degrees temperature and a pressure of hundreds of atmospheres.

This miraculous material will continue to be found useful in many fields. There certainly is

no shortage of it. Pure quartz serves another purpose, but here delicacy is involved—the piezoelectric effect for the control of radio frequencies.

BALL, ROLLER, AND SLEEVE

BALL, roller, and sleeve . . . What connotation do those words have? What do they mean to you?

They are the very stuff out of which our highly mechanized civilization is made—they are bearings for wheels and all other rotating devices. It is agreed that the basic element of modern industry is the wheel. From it are made our gears, and a hundred other parts of machines. Equally important, it is necessary to mount these rotating things on shafts or axles where they may spin with minimum friction. And of course the resultant bearings often determine the efficiency of the total machine.

The first and simplest bearing is the simple hushing or sleeve which is nothing but a hollow cylinder around the rotating part. It may be of steel or habbitt or brass or bronze or even wood. It may be lubricated or not. Some sleeve bearings are made of sintered metals into which oil is forced making them self-lubricating. Up until the beginnings of this century sleeve bearings were the only kind. Unfortunately, associated with them is a considerable amount of friction due to the very nature of their supporting surfaces. Nevertheless they still have their uses. The bearings for the crank shafts of gas engines use them and in many other places where extremely heavy loads are encountered, sleeve bearings are useful. Also their simplicity and consequent cheapness make them desirable wherever possible.

It is in ball and roller bearings however that we see the ultimate in scientific advancement. Where extreme speed is necessary, these "anti-friction" bearings as they are called, are almost always used.

The manufacture of ball bearings relies on, as is so common in modern technology, a very simple technique. The bearings are made by taking crude steel balls as they are cast, placing them between two contra-rotating plates loaded with water and abrasive and rotating them. Such random rotation produces a perfect sphere. Finer and finer abrasives are used until eventually the bearings are accurate to within millionths of an inch of sphericity. They are then sorted according to size and assembled in their races.

Ball bearings are a keystone of industry, witness the care with which the Air Force in the last war tried to destroy enemy plants manufacturing this critical item.

New inventions in ball bearings include those which are lubricated for the life of the machine by being surrounded with a jacket of suitable lubricant.

In the new two hundred inch reflecting telescope, the bearings which support the monstrous structure are of a sleeve type. Oil under hundreds

of pounds per square inch pressure is forced between the two parts, so that the telescope literally "floats" on a film of oil. The friction is so slight the gigantic instrument may easily be moved by hand.

Wooden bearings, rubber bearings, and bearings of plastic are used on applications involving water lubrication such as in ships' propeller bearings, water pumps and the like. Industry can't "grind to a stop" as long as the bearings are working!

INTERNATIONAL INDUSTRY

THE year 1948 will be long remembered in American and English scientific and industrial circles, for an event has occurred, which brings the basic union of the two countries in much greater intimacy. It is not widely known. It is not an earth-shaking affair. Many people will remain ignorant of it. Yet it has vast significance.

The British and the Americans have come to an international agreement on screw threads!

You may, off-hand, think that that is a trivial affair. On the contrary, it is of the greatest importance. It all begins with the fact that we and the British have screw threads of slightly different form. In the British thread the angle employed is fifty-five degrees, in the American, sixty degrees. Exhaustive tests have shown no appreciable difference in quality or strength of the bolts and nuts employing these different thread shapes.

Now it is well known how closely the United States and Britain have been linked in war-equipment manufacture. But it isn't so generally known how difficult the exchange of industrial apparatus has been. Because no British nuts fit any American bolts, it has been impossible to interchange equipment. In the event of war this can be disastrous. It certainly costs a vast fortune.

For example, when the British had us building Rolls-Royce aircraft engines, the blueprints which were shipped over here had to undergo an elaborate transformation at the hands of American draftsmen, in order that the machines could be tooled to produce the British standard threads. A vast amount of time was lost.

Finally the engineering societies of the two countries have gotten together and come to a fundamental agreement—strongly pushed by the military—to use a standard thread-form. Because the sixty-degree angle has been adopted by the British, most of the change and disadvantage accrues to them, but we have agreed to a rounded root and a flat top on our threads. This involves a negligible change in American standards.

The results will not appear for some time, and in the event of war of course, they will show to the greatest advantage. All British manufacturers will gradually change over to the new standards in threads, so eventually any American bolt will fit any British nut.

It's about time something like this happened. As is well known the rest of the world including

Germany, Russia, France, Italy, etc., uses the metric system and of course the metric standard of threads. Thus it was surprising to what extent the products of such countries were interchangeable.

A thread seems like a small thing, yet, because bolts and nuts are used so extensively in machinery construction, it is at the very foundation of our machine-age civilization. As time goes on, more and more things of this sort will be standardized. The British are going so far as to change their fifty cycle 220 volt electrical systems for ships, to the American standard of sixty cycle 110 volt.

All we need now to make the world happy is to set up an international moral standard, a standard to which everyone would conform. But unfortunately, it's a lot easier to change machines than people.

SPECTROGRAPHIC ANALYZER

EVERY steel mill maintains a large and complete chemical laboratory—not for research—but simply to analyze the output of its facilities. This is necessary because, while the steel is “cooking” any necessary constituents must be thrown in. To know what to add to the metal requires a knowledge of its composition.

It has been the practice then of the steel mills to sample their product, shoot that sample to the laboratory and then wait two to four hours while a painstaking analysis was made. Meanwhile, the composition of the metal may have changed, as was often the case, so that the technicians could never be exactly sure of what was coming out of the open-hearth furnaces.

But this is changing as are so many things in industry under the impact of the application of physics. A small instrument making company, Baird Associates, formed not so many years ago, is producing an instrument which is another link in the ever increasing chain of automaticity that surrounds today's industries. This gadget is known as a “spectrographic analyzer” and it takes a sample of material to be analyzed, works it over for a minute and then delivers the answer as to its composition in a couple of minutes! While its present application is greatest in the steel mills, it has a host of other uses and petroleum companies,

chemical companies and other companies requiring careful control of their product, are seizing upon it. The major fact about it is that it can make a chemical analysis of a substance in minutes rather than hours as is the case with “wet” chemistry involving mazes of glass tubing and complicated, time-consuming, procedures.

How does it work? Its principles, as in the case of all scientific apparatus, are not new. But it required a blend of a couple branches of physics to produce an every-day working tool.

It contains first of all, an electric arc into which a specimen of the subject to be examined is fed. The heat of the arc converts the substance into a radiant gas, giving off a spectrum. The light from the arc is passed through a slit to a reflecting grating, which serves the same function (only better) that a prism does. This grating breaks down the light into its constituents, and since every substance has associated with it a spectrum characteristic of it, an examination of this spectrum will tell what and how much of what, is present.

And this is where ingenuity comes in. Ordinarily a photograph of the substance's spectrum would be made and from this, its composition deduced. But not in the Baird instrument. It is designed to give instantaneous results. The spectrum is scanned by a battery of photo-multiplying tubes, which detect and measure the intensity of each particular substance's spectrum. The resultant output of the photo-cell, an electric current, is fed to a condenser, the charge accumulating, proportional to the quantity of the substance present. By measuring this charge by bleeding it through a resistor and measuring the resultant voltage, the quantity of the substance is then known.

By this wedding of spectroscopy and electronics, all you have to do now is look at the dial. It says “so and so much Manganese.” Then you send an order back to the furnace and if necessary, the attendant throws in more Manganese. It's that simple. And the main thing is, you can know at any instant the state of your steel.

Right now there are plans afoot to bring this wonderful tool into a host of other industries. The day is coming, as this magazine has so often pointed out, when factory processes of practically every type will be completely automatic.

COMING NEXT MONTH

“The Flame Queen”

By GASTON DERREAU

She was the most beautiful woman alive, and her embrace was a flaming death . . .

DISCUSSIONS



AMAZING STORIES will publish in each issue a selection of letters from readers. Everybody is welcome to contribute. Bouquets and brickbats will have an equal chance. Inter-reader correspondence and controversy will be encouraged through this department. Get in with the gang and have your say.

Address Your Letters to:

AMAZING STORIES "DISCUSSIONS," ZIFF-DAVIS PUBLISHING CO.

185 North Wabash Avenue, Chicago 1, Illinois

MORE ABOUT PLAGIARISM

Sirs:

Brace yourself for a shock like you've never been shocked before, for I am about to impart to you, news that will leave you astounded to the end of your days. I AM NOT A SHAVER FAN—NOR AM I A BURROUGHS FAN.

Am I human? Of course I am human. Look at me. I have four legs, six arms, two heads, scales all over my body . . . Am I human!

I picked up the January issue of AS today, and while perusing Discussions, noticed that while you got many letters denying the truth of Mr. Shoup's accusation of plagiarism on the part of Richard Shaver, you got (or should I say printed?) none supporting his argument. I decided that this was a wrong that needed a rightin', pulled out my trusty, rusty portable, and here I am. But, before I go any further, I would like to point out that I read neither "Gods of Mars," nor "Gods of Venus" and am basing my opinions solely on the letters, you, Ed, printed, and your replies to those letters.

Point 1. Mr. Shoup did *not* say that GOV was plagiarism; he said it came dangerously close to plagiarism. I bring up that seemingly minor point because you, in your reply, stated that nowhere in the whole story is one sentence of Shaver's identical to one of Burroughs. Of course Shaver wouldn't copy it word for word; nobody would be that foolish. But in pointing out the fact, you seem to be of the opinion that Shoup did accuse Shaver of plagiarism.

Point 2. You say that every one of the stories you've published come perilously close to plagiarism. They may come close, but not as close as GOV seems to come to GOM. And in his letter, in your January issue, John Harwood points out (although he does not say so) that the endings of both GOV and GOM are identical except for names. I will concede this much: Shoup is awfully fast and sharp with his criticism. Relax, Forrest, so what if it is plagiarism? Ye Ed didn't force you to read it, did he?

Point 3. My dear Miss E. J. Trainor. I sym-

pathize with the emotions you and any other loyal Shaver fan-atic must have felt upon seeing Mr. Shoup's letter, but isn't accusing him of "childish gibberish" going a bit too far? As far as I can tell, every positive statement Shoup makes seems to be supported by fact.

Point 4. To Miss Georgia Bartholomew. Forrest Shoup did not say that he didn't like Shaver—he probably does. He was only complaining about this one story. A little harshly, I'll grant you, but the fact remains that Shoup said nothing against any other of Shaver's stories.

I guess that's all I got for now, but let me leave you with this question in mind: Why are the Shaver fanatics that praise him most loudly and make the greatest clamor should anyone say anything against their "dear little Richard" for the most part women or girls?

Dirk Schaeffer,
803 West Center St.,
Alma, Michigan.

First, we grant that you are human. But we don't believe your scales are as big as ours. And besides, you don't have any gill-slits. Next, let's define plagiarism: It is the reproduction as original work, of at least seven consecutive words of somebody else's work. Therefore, Shaver did not come dangerously close to plagiarism. He was as far away from it as any story ever written. So, we must establish that either it was or it was not plagiarism. Close has nothing to do with this matter. Obviously, it was not plagiarism. It was an original work, in every detail. We'll go on to another point—there is a similarity in title. But we also published "Gods of the Jungle," "Madcap of Mars," "Merchant of Venus," etc., etc. The similarity in titles certainly isn't unusual—in fact, the editors sometimes go nuts trying to think up an original title, or at least somewhere near it. Sometimes we run identical titles. Also, the endings of the two stories are not identical at all—unless you consider that being separated from your loved one tragically by a closing door is identical. Certainly, any author who wants to separate his lovers at the end may do so. Bur-

roughs used a circular revolving chamber, geared to the sun, so that it would not revolve to the same opening for a Martian year. Shaver used a time cubicle, in which time did not exist, so it might not open forever. The only thing identical was the separation, which Shakespeare also used in several of his stories. Where Shoup was wrong is in accusing Shaver of coming dangerously close—which is an impossibility. Either your copy directly, or your work is original. Shaver's is original.

Now, Mr. Schaeffer, why add the atic to fan in your letter? Are people who like one author over another fanatics? Or are they exercising a certain amount of freedom in their thinking and taste? Any letter of criticism is "going too far." And none of Shoup's statements were supported by fact. What were the facts?

As for your last question, what is the reason? We can't answer it, but since you asked it, maybe you can? But actually, we're all friendly in discussions, and we all like to blow off steam. What's the department for, if we can't yell and scream and stamp our feet?—Ed.

VERY QUEER!

Sirs:

Enclosed is an article which a very good friend of mine had written. I happen to know that these things of which he writes are the strange but real live truth.

(Mr. Shaver please note.) I wish to add a few things which he did not write of or was too scared to do so.

Before he had written his articles to your magazine, he told a group of us a strange story. Yes, a story so strange that we declined to believe it until he showed us the strange truth. PHOTOGRAPHS. Now some of you say that photos may be touched up but the roll of film was developed in front of our own eyes. I will now tell you the story leading up to the actual taking of the pics.

Two men drove to Mendocino county as they had heard of the goofy happenings and decided to see for themselves. They had driven about 120 miles and it had taken them about 3 hours. Then they had entered the mystery borders of the county. They had then noticed that everything had a depressed feeling. Themselves, the countryside, and even their car which was a 1941 Packard, butane powered. As time dragged on they had gotten used to this odd feeling of depression.

The two men were slowly driving along and all of a sudden they came to an abrupt halt. They had seen something. What they had seen is almost incredible to have to believe. This is what they saw.

As they were going along they saw a beautiful young girl sitting naked on a branch of a tree. They hopped out of the car with a camera ready to snap a picture as soon as they got to the base of the tree, but as soon as they got there the girl (or it) had vanished in front of their eyes. They thought that this was very funny so they blamed

this on their imagination. While they were out of the car they decided to explore around. When they returned they saw the "it" again and they both snapped a picture of the "it" before it had a chance to vanish.

As soon as they put the camera down, a tree was standing where the girl or "it" was. They decided that this depressing atmosphere had played too many tricks on their sane minds, so they hit-tailed it back to the city (S.F.) as fast as that butane job would carry them.

When the process of the color film they had taken was finished and dried we saw what they had seen.

You may not believe what I'm about to say but we have checked the film again and again. The film we checked was a genuine photo. NO trick photography or double exposure or any hocus-pocus. Here's the facts.

The first pic we saw showed a tree standing in the grass and nothing else. The second pic we saw showed a most horrible scene that showed a girl and a tree combined as one.

That is my story. Clear Lake has many underground caverns that we know have no endings and others that run to the S.F. bay. As little have we studied these not normal happenings, we seem that Mr. Shaver's little bad boys, the deros have a hand in this. (How about it, Brother Shaver, does it tie in?)

I will not mention names as it is obvious.

To you who have read this, I offer you no proof of the pictures as we will not let any one see them until our excursion to the county is ended and our little true story is done up in amazing story print. Also this story is one of many. To those of you who want to know more about these stories, will be impossible. But some day you will see them in print.

I would like it very much if those interested in this thing could send me data on excursions like this. Also if friend Shaver would send me stuff on the deros and his book that saved him from death, "How to Win Friends and Influence Deros."

As of yet we have only two people in our excursion plans. The rest were chicken. So as soon as we get some more people, money, and equipment we'll be on our merry but gruesome way. We'll leave in about a year and stay about 6 to 8 months (we hope). When we come back (if we get back, I should say) we might have the dero tied down and thinking our way.

To those interested, drop me a line.

Robert K. Newkirk,
115 Central Avenue,
San Francisco 17, Cal.

Well, here's your story, in amazing story print. We'd sure like to see that picture! You guys have all the luck.—Ed.

YES, WE GET AROUND

Sirs:

I have a rather interesting experience to tell you. First, I have been reading your F.A. and

A.S. for about 6 years. I really like them. I will confess that I read them mostly for reading material, but now and then a story will make me stop and think. For instance "So Shall Ye Reap" by Rog Phillips. It was very, very good. And I'll never, never forget "Doorway to Hell." This Shaver thing is, to me, a lot of nonsense, but I guess most people really take his writings to heart. Enough of that for now . . .

This is what I really want to tell you: During the war—in 1942—I wrote you a letter and you published it in A.S. A short time after that I began getting letters from service men wanting me to write to them. I was 20 at the time and I answered them—you know, young and willing? Because of that letter I corresponded regularly with about 30 service men. Soldiers, sailors and marines. I never did meet any of them. I finally had to get a file to take care of the letters. I enjoyed writing so much. It was surprising how your magazine got around. All over the world—even in wartime.

My little contribution to the war effort was writing letters and welding in a shipyard. The former was due to you only.

Do you recall the story that you once published about a very nice vampire who was in love with a girl who ate garlic? It was so cute . . . one of the two stories that I talked my mother into reading. The other was "Doorway to Hell."

I've wanted to write and tell you about those letters for a long time, and finally got around to doing it.

Hope it kinda pleases you to know that just everyone reads your wonderful magazines . . .

When are you going to start printing *Mammoth Detective* again. I loved that magazine—John Evans is a fine author.

Betty Kenealy,
1515 S. Figueroa St., Apt. 107,
Los Angeles 15, Cal.

Thanks for your letter. We certainly are pleased! We do remember the vampire story, and we agree with you about it. As for "Doorway to Hell" we liked the first part of it much better than the last. As for *Mammoth Detective*, we have hopes for it before long. We liked John Evans too. But there should be no reason for tears on your part—didn't you know that Bobbs-Merrill is still printing his stories in book form? Why not read them there?—Ed.

RESULTS ON POLL

Sirs:

KEEP SHAVER OUT OF AMAZING STORIES.

Mitchell Badler,
Bernard Lloyd,
Norman Freeberg,
1711 Davidson Ave.,
New York 53, N. Y.

Well, there are three votes against the Shaver Mystery. There were three more, making a total of six. As for the number of votes in favor of it,

there were 132. Quite obviously a very strong percentage in favor of it. But, 138 votes is hardly enough to make any drastic change in policy, so we'll just drop the matter there. It would have taken a good many more letters to bring it back—say 75,000. After all, we want to satisfy the majority of our readers, and the majority were silent, so we'll just go on presenting the best science fiction we can find—and we have no doubt but what Shaver will submit his fair share of that! So, there you are, you Shaver fans.—Ed.

SUGGESTION TO SHAVER FANS

Sirs:

Here is my vote. I am one of the readers who wants the Shaver Mystery back. And I am sure that the majority of readers of *Amazing Stories* want it back too. It would leave Mr. Shaver more time to get his material out to us. As it is now, he is trying to do everything alone. You could take that load off his shoulders by publishing his stories. I don't know why you stopped publishing his stories in the first place, but I can guess. And my guess is that you are not entirely to blame. But after all this is a free country, isn't it?

If it is at all possible, by all means give us the Shaver Mystery back again as soon as possible. Thanks for a good magazine, and I wish you continued success.

G. Johnson,
Rt. 1, Box 347,
Lake Grove, Ore.

Here we must explain that when we say "The Shaver Mystery" we mean Mr. Shaver's stories, as a whole. We mean his creation of a civilization in giant caves, and of a race in far space, who once lived here. When the Shaver Mystery is referred to as something organizational, there we must remain completely neutral. This magazine cannot engage in anything like that. If our readers join together in Shaver Mystery clubs, we think it's fine—but we can't back anything of that nature. We will publish Mr. Shaver's stories as we do any good stories. But when it comes to doing it as a "great mission," there we simply shrug our shoulders. Certainly, all science fiction is "true" in that it has a record of forecasting the future. Shaver's stories have done as well as others in this respect. But much of his "truth" relates to the past. In that, he is different. We suggest that real hard and fast Shaver fans subscribe to his *SHAVER MYSTERY MAGAZINE*, if they really consider his Mystery important. That would do more good than anything else we could think of. We absolutely cannot enter into that segment of the Mystery. That's much too close to the word fanatic. We can't take anything that seriously. Our intent is solely entertainment. Let us say that we will present the Edmond Hamilton Mystery, the Rog Phillips Mystery, the Henry Hasse Mystery, or any other author who writes a darn good series of stories, and we may even call 'em true. Would that satisfy all of you? We think it would. How you BELIEVE, is your business.—Ed.

AMAZING CROSSWORD PUZZLE

By BRUCE D. KELLY



HORIZONTAL

1. AMAZING theorist
7. Close
13. Brawny
14. Third stomach of ruminants
15. Knight
17. Third tone, diatonic scale
18. Crucifix
20. Corrodes
22. Rainy
23. Work room of chemist (Short form)
25. Intellect
27. Type used for emphasis
30. Common logarithm base
32. Not specified (abbr.)

33. Seventh letter, Greek alphabet
34. Impress by insistent repetition
35. As described
36. Bleat
37. Doors
39. One who cans
41. Except
42. Convert skin into leather
43. Printing direction
45. External opening of the ear
46. Preposition
48. Daughters of Atlas and nurses of Dionysus
50. Starchy tuber of American solanaceous plant
53. Deliver from bondage
55. Noises accompanying somnolent breathings
56. Promontories

VERTICAL

1. Space ship whose flight was recorded by Geier
2. Interjection expressing delight
3. Spanish weight used in Mexico
4. Empty
5. Superlative suffix
6. Anatomy: plexus
7. One's strong point
8. Assimilated form of prefix "in."
9. Slang: seize suddenly
10. Roman libra
11. Unit of light
12. Send out
16. Hearing organs
19. Grains of avena sativa
21. Trenchant wit
22. Triumphed
24. Shaverian giants
26. Dispatched
29. Symbol for calcium
31. Favorite remedies
34. Bring about
35. Printing: to blur
36. Prohibit
37. Commit depredation
38. Ill-uses
39. Ecclesiastical decree
40. Universal element in a work of art
42. Summits
44. Small mountain lake
45. Sleeping places
47. Equality as to value
49. D-shaped
51. Preposition
52. Symbol for tellurium
54. Suffix indicating object of an action

(See page 154 for solution)

SWING LOW, SWEET PENDULUM



By ROBERT QUENTIN



IT IS generally agreed that great scientific advances usually depend on comparatively simple things for their inception. As a result, the workshop and the laboratory often produce ideas which all the profound cogitation in the world can't offer. This is especially true in modern science where instrumentation and the development of scientific apparatus generally has provided the basis for advances.

The early history of science however, is also laden with advances caused by instrumentation. The barometer, the air pump, the thermometer—and the pendulum—all have had their deep and lasting effect on science.

The last-named device, the pendulum, probably has a more important role in the history of science than is generally realized. It was the machine which introduced precision into science.

The popular legend, and we may well believe it, has it that Galileo Galilei sat in church one day when his attention was distracted by a huge pendant lamp suspended by a heavy chain from the roof of the church. An errant breeze or a vibration set the lamp into oscillation and it swung slowly to and fro in front of his eyes. Always of a speculative and thoughtful turn of mind, the great scientist watched it swing slowly back and forth at the end of its long suspension.

There was something peculiar about it. Galileo started to time the swings with the only clock he had—his pulse. A great scientific fact was about to be discovered! It was the fact that a pendant body, a pendulum, was isochronous! That is, it swung back and forth in equal times, regardless of the amplitude. When Galileo realized this fact he

set to work studying it, and we know the results. It is found that a pendulum will oscillate with the same period, whether it swings four degrees or three degrees!

This principle is more important than it sounds. Its incorporation in clocks gave man for the first time an accurate method of measuring time and the resultant skill acquired in clock making became eventually the science of instrument making general.

A clock basically consists of three things, a power source, a control element, and a timing element. The power source in early clocks was either a spring or a falling weight. The control element was a gear-ratchet combination, and the timing element was the inevitable pendulum.

Up until very recently any clock which was made for extremely accurate, scientific time-telling required a pendulum. The famous Rieffler clocks in the U.S. Bureau of Standards employed long pendulums which vibrated extremely accurately. As we now know, the pendulum clock is inferior to the electrical clock employing a quartz crystal, the latter derived from radio technology.

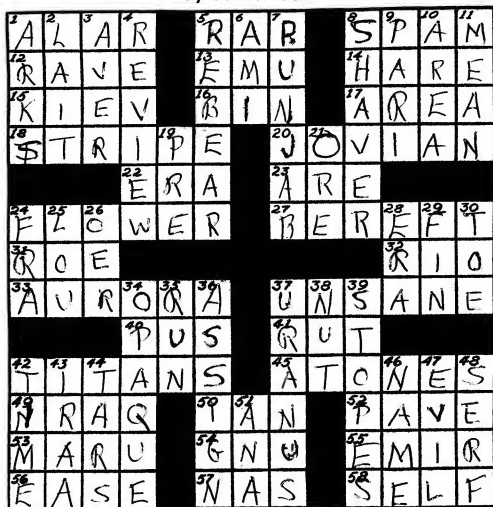
The automatic self-winding watch so very popular now employs a pendulum a little differently. This pendulum is nothing but a swinging weight whose function is to provide power to wind the mainspring so that the watch will operate. It bears no relation to isochronism.

A pendulum is employed in the automatic compass. Many other scientific instruments depend on the pendulum for their operation too.

THE END

AMAZING CROSSWORD PUZZLE

By D. W. BUSH



HORIZONTAL

1. Having wings
5. Initials of editor of this Magazine
8. Canned meat used by our armed forces
12. Rage
13. Australian bird
14. Edible rodent
15. Russian city, frequently in the news
16. Storage place
17. Plane
18. Stroke made by a whip
20. Pertaining to the System's largest planet
22. Period of time
23. Present tense pl. of verb to be
24. Bloom
27. Deprived
31. Fish eggs
32. River (Sp.)
33. Polar lights
37. Not in control of mental facilities
40. Secretion from a festering wound
41. Mark made by many wagon wheels
42. Gigantic beings mentioned in the Shaver Theory
45. Becomes one with
49. Near Eastern Asiatic country
50. Man's first name
52. To lay pavement
53. Japanese steamship line
54. Horned animal
55. Mohammedan prince
56. Gently guide
57. Symbol for sodium (plural)
58. Ego

VERTICAL

1. Tables of the law, in Jewish tabernacle
2. Milk (French)
3. To affirm
4. Re-examine
5. Carry again
6. Friend (French)
7. Gigantic comic strip character
8. Author of a famous mystery, peculiar to this Magazine
9. Prefix signifying "equal"
10. Plane surface
11. Unkind
12. Before (prefix)
13. Rock containing metal
14. Brother (Latin)
15. Man's name (ahhr.)
26. Covering, more than (poetic)
28. Period
29. Appendage peculiar to fish
30. Extreme lower extremity
34. Not transparent
35. Cover distance speedily on foot
36. To appoint
37. Large planet in our system
38. Kernel containing fruit of certain trees
39. Hard rock mining machine in action (present tense)
42. Measure of duration
43. Babylonian god
44. Sailors
46. By which a thing is known
47. Iniquity
48. Slave
51. Literary excerpts

(See page 154 for solution)

WHAT'S BEYOND COSMIC RAYS?



By CHESLEY LOGAN



UNTIL very recently it was common to see charts of the electromagnetic spectrum, starting with low frequency radio waves and progressing through the short waves, micro waves, infra-red, visible light, ultra-violet, long x-rays, gamma rays and then finally cosmic rays. And until a short while ago cosmic rays were thought to be a legitimate manifestation of electromagnetic waves. But recent researches have indicated that this is probably not true.

Cosmic "rays" whose name comes from the fact that their origin apparently is in deep space, exhibit more of the properties of extremely high energy particles whose penetrating ability is astounding. With energies of hundreds of millions of electron volts, these so-called "rays" are able to enter into amazingly solid aggregates of materials.

Since it is becoming apparent that cosmic rays are not truly "rays" in the conventional sense of the word, meaning electromagnetic rays, the logical question comes up—"beyond gamma rays, are what? Are there other electromagnetic radiations of shorter wavelength than extremely hard x-rays?"

These questions as yet go unanswered. While to the best of our knowledge it is possible to give an answer to the limitations on the size of atomic and sub-atomic particles, no such limitation appears in the case of electromagnetic waves. The proton, neutron, and other particles have physical diameters, as well as can be determined, of very slight magnitude. No smaller particles, at least by any great factor, have been discovered, or seem likely to be. Thus we may say that we have the limitations of particles.

But what about waves? Gamma rays, which are x-rays of very short wavelength and mighty penetrating power, are so far the limit of the electromagnetic spectrum. Can we imagine still shorter and more powerful waves? Well, theoretically we can. The penetrating power of an x-ray, its "hardness" in the technical verbiage, is dependant upon its wavelength, which in turn is dependant by a simple relationship, on the voltage used to produce it.

An x-ray is generated by hurling an electron against a target of some metal, usually tungsten, through an electrical potential. This potential in certain tubes has amounted to two and one half million volts. The higher the voltage the shorter the wavelength. The General Electric Company has built a huge betatron, whose function is to accelerate electrons to tremendous velocities. This is the equivalent of putting them into a strong potential field. It is measured in the same terms—volts or megavolt. It is predicted that the electrons may be given energies corresponding to tens of millions or hundreds of millions electron volts.

Now what will such electrons do? For one thing they will be used to create extremely penetrating x-rays. Will a stage of energy be reached possibly, where the waves produced by the electrons impinging against their tungsten target, be x-rays no longer? Will some new form of radiation exist? We do not know.

Perhaps some factor will be found which will limit the wavelength of electromagnetic waves. We can only speculate, but this writer has the suspicion that we may be in for some great surprises. We certainly hope so.

* * *



The CLUB HOUSE

Where science fiction fan clubs get together.

Conducted by ROG PHILLIPS

IT'S happened! I had hoped that it never would. Sometimes I lay awake nights wondering if it will, and then again sometimes I think it's impossible. I can't think of anything to use as a subject for the editorializing I do at the beginning of the CLUB HOUSE each time. Shadup, you over in the corner. You'd do the same if you had it! I wrack my brains, and all that comes out is—nothing.

By the day, did you know that nothing wasn't discovered until only a few centuries ago? Nothing was such a controversial subject to the ancients as nothing. They didn't understand nothing, and even today it's difficult to understand nothing. And yet it's an important concept—that concept of nothing. In arithmetic it's represented by the symbol, zero. Actually, modern mathematics didn't begin until zero was invented.

There's a significant difference between nothing,

and nothing at all. For example, right now, I'm talking about nothing (how'd I get started?), but if I was talking about nothing at all I wouldn't be talking about nothing, because nothing is something. That's a significant difference.

Calculus and analytic geometry develop the concept of nothing to a fine art. They didn't really get their start, though, until somebody got the idea of dividing nothing by nothing. That idea drove a lot of people insane.

Actually, it was two people who got the idea of dividing nothing by nothing. They got the idea about the same time; one of them in England, who had been walking under an apple tree and an apple fell on his head; the other living in Germany and getting curious about how you could tell how much a beer barrel would hold without actually filling it with beer to find out.

Leibnitz, the German, had a lot of other ideas, too. If *Amazing Stories* had been brought out in his time he would have been an outstanding sci author. As it was he had to get his stuff written up in fanzines as they were in those times, and since about all the science there was was the rudimentary stuff you get in the first two weeks of high school physics before you really get going for the year, most of the fans of those days played around with numbers and mathematics and wrote long letters to one another, and even had conventions here and there, and founded clubs.

Everything was wide open in those days. Get an idea and presto you had something brand new. They didn't even know for sure that air was made up of elements. And most of them would have argued all night if you had told them fire wasn't an element. They called it phlogiston or some such word.

The schools in those days didn't have anything to teach because everything anybody knew could be crammed into a quick summer course, so they kept open by making everybody learn Latin real well so they could write letters in it and make each other think they were smarter than the ice man—I mean the stableboy; they didn't have iceboxes then, but they had horses.

I guess they had a lot of fun, though, in the fan clubs of those days. Once in a while they got into trouble. There was one fellow—Galileo was his name, I think. He made a homemade tele-

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scope. I think he had to invent it first if I have my facts straight. He looked through his telescope and wrote to other fans about what he saw, and pretty soon he found that he was interfering with the "facts" of things as they had been nicely settled for ever since his great-grandfather was a kid. After that narrow squeak he sort of dropped out of fandom for awhile, and came back in later.

But even in those days the fans took their activities seriously. One group in London, that gave itself the high sounding name of British Scientific Society or something similar, had quite a few members who attended once a month and wore white wigs to make themselves look dignified and more or less allow the teen-agers to seem as old and wise as the others. They put out a fanzine and sent it out mostly on trades with French and German zines. It was quite a job with no mimeographs or hektographs.

Somebody with a sense of humor played a trick on the British fan group by writing them a letter asking them why it was if you take a jar so full of water that one more drop will make it run over, you can put a fish in and the water won't run over. They stopped arguing about Zeno's paradoxes for several years and spent all their time arguing about that until they lost a lot of their members. Then one upstart that had just joined the club decided to settle the problem once and for all. He got a jar, a small fish, and some water—and there were a lot of disgruntled fans around London for a while.

They forgot all about that soon enough, and when Newton and Leibnitz started dividing nothing by nothing and getting such wonderful results they jumped on that. It made quite a feud for a long time with fans taking sides and arguing hotly about it. Even today it's a touchy subject, and respectable professors in today's schools refuse to say anything about it that hasn't been settled for a century or more. I don't blame them.

The argument was finally settled by everyone agreeing that you didn't really divide nothing by nothing, but only seemed to. It might have gone on even after that, but somebody about that time dreamed up the Scientific Method of an outgrowth of the incident of the fish, and everybody in fandom started building gadgets and making experiments and having a lot of fun. It was really quite constructive, too, although other people didn't think so.

The idea took and spread all over. You'd find some of the unlikeliest people taken up with the idea of experimenting. Take Gregor Mendel. He was a priest, and when he learned about the experimental method he wanted to play with it as a hobby, but was afraid of losing his job if he did. So he got the bright idea of experimenting with garden peas. It was fool proof. When one of his bosses showed up at the local church all he'd see was just peas growing on vines.

Gregor put out a one-shot fanzine telling about his hobby and what he had found out about peas,

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and some collector hung onto it and donated it to a school that later became quite popular with the set that believes the best education is obtained somewhere a long ways from home where the folks can't learn what you do during the evenings.

But in fandom in those days everybody was going his own way. It was only later that ideas became scarce, and fans started culling over the old fanzines and putting them into some sort of order and tabulating the results all the fans had gotten in their playing around with this and that. That one-shot laid on a shelf in the library of the school until one day somebody read it and started fooling around with plants himself. Several fans did that about the same time, and they all came out with books on their own results, and shortly the science of genetics was founded.

A lot of other sciences were being founded about that time, and fan clubs were going respectable. In fact, they were so respectable they were no longer fan clubs at all. The good old days when a little fast brainwork would result in something worth writing chain letters in Latin to other fellows about were gone.

A new type of fandom was emerging, epitomized by Henry Ford and Tom Edison. As the previous fandom had found its *modus operandi* in the experimental method, with its rich paydirt of discovery in the fields of elementary science, so also the new fandom a *modus operandi* in something—this time the patent laws.

Where, before, the idea had been to get a theory and devise an experiment to prove it, and make a name for yourself, now the idea was to get an idea, patent it, and find a guy who was willing to hand over a hundred thousand dollars and a nice royalty on top of it. Very few of the new fans—now called inventors—were that lucky. Most of them had to sweat out their first hundred thousand dollars by themselves, manufacturing the product embodying their invention themselves until, like Hank's horseless carriage, it "took," or, like Tom's electric light globe, it began to work good enough to be dependable.

As before, the field was wide open, and almost any idea that would work was good for a jackpot, although the fan that got the idea was seldom the one who had his hands under the chute when the machine let loose and coughed up the nickels.

From about the turn of this century until in the twenties this new fandom, the Inventors, flourished. In almost any neighborhood at all you'd find half-a-dozen or more.

There are interesting parallels to remember. In the first fandom, the Experimentors, the idea was to devise a new laboratory experiment or discover a new natural law, and gain recognition. In the next fandom, the Inventors, the idea was to get an idea for a new gadget and gain recognition and money. The Experimentors had attained stability by standardizing the inch and the centimeter, the second as a unit of time, and the degree of heat, C or F, interchangeable. The Inventors attained

stability by a similar standardization of sizes, shapes, and threads.

Both waves of fandom followed a similar pattern of history, beginning with the crystallization of the pattern of life in fandom; centered about the laboratory experimental method in the first and about the patent-industrial system in the second. Both wound up against the same kind of a well eventually. It got more and more difficult to find original paydirt.

The experimenters had to become specialists, and that takes a somewhat different type of person than the average fan. The inventors also had to become specialists. Technicians.

BUT, the human race went on reproducing, generation after generation, and the same types of people appeared in about the same numbers, and in the natural scheme of things the first issue of *Amazing Stories* appeared on the stands, put out by Hugo Gernsback who had been feeling around with the idea of publishing something with the same kind of appeal as an Erector Set.

Once again the fan element of the human race found a field—modern science-fiction. Its tools, the mimeo machine and the typewriter, were at hand.

And again we have parallels with the two previous waves of fandom. Next month I'll try to show those parallels as I see them. I'll also try to show that the present fandom is—not the top deck of a three-decker sandwich, but the current deck of a multi-decker Dagwood sandwich whose bottom slice of bread rests in the antiquity of history, and whose future layers can be roughly guessed at.

The gist of the whole thing is, of course, that fandom is a natural growth in the human race, and repeats itself along much the same lines each time it is born, and can be studied by the system of historical analysis used by Oswald Spengler, with very enlightening and interesting results.

* * *

FANTASY TIMES: twice a month; 10c, 12/\$1.00; James V. Taurasi, Ray Van Houten, J. Russell Mars, editorial staff; 101-02 Northern Blvd., Corona, New York. The October issue is the last one on the monthly schedule and 15c price. Cover by Herman Tok. Up-to-the-minute news is the main policy of F-T. In line with this, it is now reporting what is to appear in the next issue of various prozines. Also reported in this issue is the appearance of a Mexican sf magazine which, the report states, is using illustrations and stories without permission of their owners.

The November 15th issue is the first of the new F-T that is to come out twice a month. Eight pages plus cover will be its regular size now. The new department, Forecasts, continues to give advance in formation on what's coming in the prozines. The Cosmic Reporter is an extremely interesting department. In fact, all the regular departments of this fanzine are interesting and as up-to-the-minute as tomorrow's newspaper today.



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A report on the MERIT AWARDS CONFERENCE says, "Fan clubs who would like to be represented at the April, 1949 meeting of the Awards Committee are asked to write Mr. Van Houten at 409 Market St., Paterson 3, New Jersey.

The Ntnt Fantasy Fan Federation, N.F.F.F., is reported to be holding their '48 election of officers for 1949. And among things reported in "World of Tomorrow Today" by Ray Van Houten, is the new printing process, Zerography.

THE BURROUGHS BULLETIN: free (but enclose a stamp to pay for sending it to you); Box 78, Manito, Illinois; Vernell and Dorothea Coriell; six pages devoted to news about the works of Edgar Rice Burroughs. Interesting news is the seventeen-year-old emulator of Tarzan in London. He saw a Johnny Weissmuller Tarzan movie and shortly was swinging in trees and uttering strange cries. (Remember when I wanted to do the same things after reading Tarzan books!) Another interesting bit of news is that John Coleman Burroughs, son of ERB and illustrator of his father's books, has some of his art work on exhibit at the Young Art Gallery in Chicago.

Vernell writes me that his next issue will be lithographed, and still free! But please enclose a stamp when you send for your copy. It's a labor of love, but love can die quick if it costs more than one can afford. Circulation of THE BURROUGHS BULLETIN is now in the three hundreds.

Did you ever bear of subsidizing something? Well, I think some of you ERB fans should think about it and maybe send Vernell and Dorothea a buck or two RIGHT NOW before your generous mood passes, to help pay the expenses of this free-zine you get to much enjoyment out of. It's my own idea, so if Vernell objects to it and won't take the money—!

FANTASY COMMENTATOR: Fall, 1948; 25c, 5/1.00; A. Langley Searles, 7 E. 235th St., New York 66, N. Y. Thirty-six pages of interesting articles and features covering the field of imaginative literature, most of which are of such worth that they deserve placing in permanent book form some day—especially Sam Moskowitz's history of fandom, titled *The Immortal Storm*, which is as careful and elaborate a history as any of the modern, analytical histories of the world. In no other fanzine can a more complete listing of current publications of fantastic literature be found regularly than in this one, and the fan editor who would keep abreast of things in his own zine should consider this a must for his reference file. The writer of fiction should subscribe to this to keep abreast of what is going on in his field. And for the same reason any fan who is interested seriously in fantasy and science fiction should be a subscriber.

THE MUTANT: bi-monthly; 10c, 50c/yr.; George Young, 22180 Middlebelt, Farmington, Mich. Official organ of the MSFS, but as I have said before, devoting a minimum of space to club

business and most of its twenty pages to top grade ore from the idea mine. What **MUTANT** adds up to, really, is a fan club putting out a fanzine, and that makes for a really good one! Those Michigan boys are a very much alive group, numbering over thirty now. Tops in this issue, in my opinion, is "The Brighton Report" by Jim Harmon, a fantasy story that could very well have been expanded into an excellent weird story for the pros.

Stewart Metchette presents an article on "The Saint Is STF," the Saint being Simon Templar, gentleman crook, whom you all know from his detective stories. It's the first I knew of the Saint having appeared in science fiction yarns, but from the reviews of some of those stories given in this article they must have been very good. (Huh uh. You'll have to get the **MUTANT** to get the details.) And while you're writing George Young for a copy of the September '48 **MUTANT** to get those details, if you live in Michigan why don't you ask for a membership blank in the Michigan Science Fantasy Society? It's one of the most alive fan clubs in the country.

THE ROCKET NEWS LETTER: Journal of the **CHICAGO ROCKET SOCIETY**; Vincent Story, secretary, 5747 University Ave., Chicago, Illinois. 15c, \$1.50/yr. The September and October issues came together for review. Secretary Pat Crossley, the Sept. issue says, has moved to Michigan, and so will be unable to continue her duties as secretary, and passes them on to the new secretary, Vincent Story. Now that you're living in Michigan, Pat, how about joining the MSFS? I think you'd enjoy that, and I'm sure they would enjoy having you.

A heavy paper printed cover now holds the RNL and makes it much easier to handle. In the September issue is a very interesting and competent article on Cosmic Rays, by N. J. Bowman, Ph.D., who is also assistant editor of RNL.

The October issue explains the reason for two issues in one mailing. "The editors have succeeded in turning out two issues in one month, thus catching up with our retrograded dating system." If you live in or near Chicago, write to the sec-



A. D. Crane

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SCIENCE FANTASY AND SCIENCE FICTION: combined with FAN ARTISAN: Oct. '48; 20c; a slick paper litho job, professional quality, half size. The art work is of professional art quality, too, and would improve almost any prozine if it appeared there! Most interesting article this issue is "Fan Origins," by Joe Schaumburger, discussing how various fans develop. "Operation Atomic," by W. Leslie Hudson, discusses what the "new" weapons tested lately by the army might be if they are not new types of atom bombs. Among the possibilities discussed are radioactive dust, an atom cannon that spews forth energy instead of missiles, a rocket-powered weapon, and "atom fire," which would be a relatively small atom "bomb" which would gain most of its strength from disintegration of the earth where it landed. Such atom fire is not entirely impossible, from what we know about it. If some element were to disintegrate into neutrons and protons on disruption, rather than splitting into two or more non-unstable (!) atoms, the sprays of neutrons could easily disintegrate ordinary atoms in the surrounding soil, and thus make a small bomb have the effect of tons of the already known type of atom bombs. Imagine an atom bomb weighing a fraction of a pound that would release a thousand percent, losing the energy contained in ten or twelve pounds of matter! And it may not be impossible!

A very good short story by Joe Kennedy is quite long for a fanzine, taking up five pages. It's called "Hair Apparent."

ALIEN CULTURE: published irregularly; 15c; 4/50c; Jim Leary, 4718 Forest Hills Road, Rockford, Illinois. Vol. 1, No. 1, January, 1949. Once in a great while a fanzine has the good fortune to get a truly wonderful article or story which should have been published in a prozine, and would have been, except for the fact that it was sent to an editor who personally didn't like it. I don't know how Jim Leary did it, but in this first issue of ALIEN CULTURE is a short story by David H. Keller, M.D., titled "The Sovereign Balm," which is one of those prize things. You have to read it to appreciate it.

Another prize bit is a short based on the old theme of selling your soul to the devil. Only this time the devil gets for one million dollars cash—not the hero's soul, but an eternal point fountain pen—the sucker! And so well is it written that even knowing the end of the thing doesn't detract from enjoying it.

In his editorial Jim Leary states, "As editor and

publisher of ALIEN CULTURE, we think it appropriate that we start out this editorial with a few words of introduction. We're pretty much a new fan, having participated in fan activities for only about a year. However, our love of stf, weird, and fantasy go back even farther. About five years to be precise. Our tastes are general; we read and enjoy most of the better known writers. As to age, we're 16, and are in freshman year of college."

And I will add that Jim Leary has put out a fanzine that is unusual, both as to quality of contents and excellence of mimeographing.

DAWN: The Fanzine From Kentucky: Number 1, November issue; 10c; Lester Fried, 2050 Midland, Louisville 4, Ky. A LETTERZINE! In the editorial Les says, "We feel that since Fandom Speaks has folded Fandom needs a good letterzine where fans can discuss current problems in fandom and out. The professional magazine, while having good letter columns, do not print letters dealing with fan problems. I find that most of the letters in current magazines from readers mostly deal with praising of the stories and the editor's magazine. Since most of this first issue will go to the fans free of charge we are going to ask you fans to pay for the first issue if you think it is worth it. When you send in your subscription let us know if you want the first issue taken out of your subscription. We hope to be deluged with letters for the second issue and if enough letters come in we'll go legal size as was Fandom Speaks."

O.K., Les, you are a brave lad to start a letterzine. I wish you all the success in the world, but feel I should warn you that the problems of a letterzine are insoluble. It is the one empty void in fandom, and the few times it has been filled, such as with Fandom Speaks, those problems soon proved too great. Maybe you will master them and your letterzine will become a permanent thing.

In addition to being a letterzine there will also be a fanzine review department and articles and stories, so this promises to be a real, all round fanzine in addition to a letterzine.

Maybe I should tell you readers NOT to subscribe to this zine, because I have a sneaking hunch so many will that he won't be able to put out enough copies to fill the demand!

FANTASY REVIEW: \$1.50/yr.; bi-monthly; Walter Gillings, 115 Wanstead Park Road, Ilford, Essex, G.B. This printed, professional zine is designed for the British readers of fantastic literature, but is equally valuable to the American reader.

Best article in the Oct.-Nov. '48 issue is that on the "Frank Reade Library," the first stf prozine, started Sept. 24, 1892, and published weekly for nearly four years. It was finally branded as "demoralizing literature" and a crusade of the "gay nineties" churches and uplift organizations managed to get it squelched. Bob Frazier, who writes the article, points out that any of the modern stf prozines, if it had appeared as is, in the

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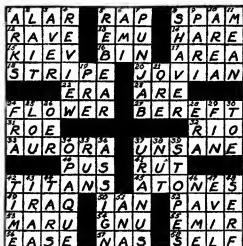
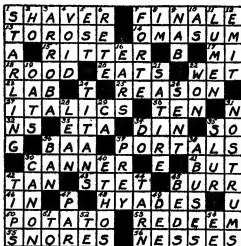
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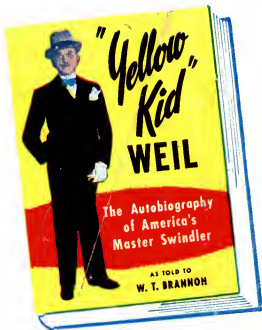
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